DOCUMENT RESUME

ED 145 847 IR 005 303

AUTHOR Davis, Mari, Ed.
TITLE Environmental Information: Some Problems and Solutions.
INSTITUTION Melbourne Univ. (Australia).
PUB DATE Dec 74
NOTE 79p.; Report of the Workshop in Environmental Information Systems at Royal Institute of Technology (Melbourne, Australia, July 15-18, 1974)

EDRS PRICE MF-$0.83 HC-$4.67 Plus Postage.
DESCRIPTORS Communications; *Environment; *Environmental Education; Foreign Countries; Information Dissemination; Information Needs; *Information Scientists; *Information Services; Information Sources; *Information Systems; *Workshops
IDENTIFIERS Australia

ABSTRACT

A workshop in environmental information systems was sponsored by the Royal Melbourne Institute and held July 15 through 18, 1974 in Melbourne, Australia. It was designed for the professional who wanted to: (1) gain insight into the nature of the information transfer process related to the environment; (2) develop awareness of types of user groups and resources; and (3) have an opportunity to exchange ideas and views. The program was divided over four days, and included morning lecture sessions and afternoon small group discussions. This report of the workshop includes: (1) two case studies on environmental information problems given to participants for discussion; (2) a synthesis of the workshop with personal reflections by a coordinator; (3) viewpoints expressed by five individuals on their environmental research and specific information problems; and (4) description of the origin, plans, and activities of the United Nations Environment Program (UNEP). Also included are a list of conference participants, program agenda, and a partially annotated list of selected Australian and International sources of environmental information: abstracts, indexes, and information services; bibliographies; conferences, symposia, and workshops; directories; library catalogs and accession lists; and periodicals. (Author/JPF)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED145847

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

A report on the Workshop in Environmental Information Systems held at the Royal Melbourne Institute of Technology, July 15-18, 1974.

ENVIRONMENTAL INFORMATION:

SOME PROBLEMS AND SOLUTIONS

Edited by Mari Davis

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Mari Davis

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

IR005303

Centre for Environmental Studies
University of Melbourne.

CONTENTS

	Introduction	*Mari Davis*	5
	Acknowledgements		6
SECTION A:	Programme of the Workshop		7
SECTION B:	Profile of Workshop Co-ordinator		13
	List of participants		13
SECTION C:	Reflection on the Workshop	*Marta Dosa*	21
SECTION D:	Problems and solutions: individual viewpoints		
	Dr. E. H. M. Ealey		29
	Dr. W. J. McG. Tegart		31
	F. Smith		34
	K. Tarrant		35
SECTION E:	The United Nations Environment Programme	*Marta Dosa*	41
SECTION F:	Further reading list		49
SECTION G:	Selected sources of environmental information		51
	Abstracts, indexes and information services		
	Australian		51
	International		51
	Bibliographies		
	Australian		54
	International		55
	Conferences, symposia and workshops		
	Australian		58
	International		62
	Directories, handbooks, yearbooks, glossaries, etc.		
	Australian		63
	International		65
	Library catalogues, assessions lists, etc.		
	Australian		68
	International		68
	Periodicals		
	Australian		69

INTRODUCTION

The Workshop in Environmental Information Systems was timely, held as it was in July 1974, when librarians, politicians, scientists and others were debating the issue of a national information policy for Australia, and the recommendations of the widely distributed STISEC report were being discussed privately and publicly via professional journals and the press. It came also at a time when the Australian public, through environmentally concerned groups voicing their need for data and information, recognised that well-informed and well-documented submissions have significantly higher success rates than those built on purely emotional bases. Two new university environmental research units had been established in 1973 — the Centre for Resource and Environmental Studies at the Australian National University, Canberra, and the Centre for Environmental Studies at the University of Melbourne. In addition, many universities and colleges were already conducting or considering new courses on environmental topics. Monash University had been offering its Master of Environmental Science course for some two years. Plans and staff requirements were being considered for the new Bureau of Environmental Studies within the Australian Government's Department of Environment and Conservation in Canberra. During the same week, the Conference on Information for Engineering and the Sciences was held in Sydney, sponsored by the Institution of Engineers, Australia, with the support of the National Library of Australia.

Information is at the heart of the environmental debate, whether it be in traditional forms or via individual communication. The Workshop was designed to examine the issues of information provision for this complex, multi-disciplinary field of study. The roles of traditional channels of information such as libraries, data banks, information services, etc., were questioned with a new awareness of the nature of communication and information transference. The role of individuals as 'gatekeepers', as links in 'switching' processes connecting information with potential users, and the dynamics of the 'invisible college', were examined in juxtaposition with questions of the constraints of personality, behaviour, attitudes, perception and the right of privacy. The importance of the individual's role was highlighted and reinforced by positive interactions during the workshop between participants, co-ordinator and the invited speakers on the third day. There was ample opportunity for debate, exchange of ideas and information sharing, both within the more formalized lecture sessions and within the informal small discussion groups.

The Workshop programme (set out in Section A) was divided over four days, and included morning lecture sessions and afternoon small group discussions. The lectures, usually lasting 1-1½ hours, were followed by lively discussion involving the total group. The informal atmosphere, fostered by the co-ordinator, allowed interaction between all members during these lecture periods with questions, interjections, affirmations, resumés, exchanges, a sharing of ideas, information and needs. Conversations on matters discussed during sessions were carried through the coffee breaks and the luncheon periods. The first two afternoons were devoted to case studies in environmental information problems (see p 9).

Participants were divided into five small groups for each case study exercise, with groups reporting back to the collected Workshop at the end of these 'brainstorming' sessions. Five people experienced in environmental research and affairs agreed to talk with the Workshop on the third afternoon, describing some of the difficulties encountered in their research and collection of information. These talks, with a selection of comments, are presented in Section C. The lecture content of day four, presented in Section D, describes briefly activities of the newly formed United Nations Environment Programme. The last afternoon was spent with participants briefly describing the nature of their work and aims, and delineating specific difficulties and needs. It was a sharing session made more positive and valuable by the confidence built up during the previous three days.

The atmosphere of the workshops was one of high enthusiasm; a willingness to examine new methods, new ideas, to break new ground and to cross communication barriers. The diversity of professional backgrounds and experience of the participants made the interactions and discussions tremendously valuable. Although most lecture sessions were taped, it is not feasible to present the full transcripts. It was an informal working session, not a conference with prepared papers. Rapid exchanges of dialogue, questions and answers, feelings of mutual rapport and enthusiasm are not easily conveyed on tape; too much of the essence is lost in transcription. Complete transcripts would have meant a diffuse content in an enormously bulky report with high printing costs. The contribution of the Workshop to the burgeoning environmental information field in Australia seems better represented with the following concise reports, over views and extracts. Many saw the Workshop as the first of many 'sharing' sessions in the future. It is hoped this publication will draw some of the threads and ideas together to form a working base for future discussions.

Mari Davis.
Editor

ACKNOWLEDGEMENTS

The assistance of the following in the preparation and presentation of the Workshop is acknowledged:
— Broken Hill Proprietary Company Ltd., for financial assistance.
— the Library Branch of the Education Department of Victoria, for providing accommodation.

SECTION A

WORKSHOP IN ENVIRONMENTAL INFORMATION SYSTEMS:

PROGRAMME

MONDAY, JULY 15.

9.00 - 10.00 a.m. Registration, morning tea.

10.00 a.m. **BRIEF INTRODUCTION AND OVERVIEW.**
(Lecture).
A unifying approach to environmental information.

1.45 - 4.45 p.m. **CURRENT AND POTENTIAL INFORMATION USERS.** (Lecture).
Variations in frame of reference, attitude and method.
Information use studies: the state of the art.
Institutions and organizations as information seekers.
Individuals as information seekers:
- Users of technical and research data.
- Planners, policy makers, decision makers.
- Participating and potential publics.

TUESDAY, JULY 16.

9.15 - 12.15 p.m. **INFORMATION USERS, COMMUNICATION AND EXCHANGE.**
Small group discussion.

1.45 - 4.45 p.m. **INFORMATION RESOURCES AND PROCESSES.**
(Lecture).
Bibliographic and other problems of access.
Institutions as information producers.
Information clearinghouses, data centres, services.
Specialized materials:
- Research-in-progress.
- Conference information,
- Translations.
- Patents.

Innovative techniques:
- Information repackaging.
- Information counselling.
- People's networks, referral.

WEDNESDAY, JULY 17.

9.15 - 12.15 p.m. **COMMUNITY NETWORK.**
Case study and small group discussion.

1.45 -4.45 p.m. **THE INTERNATIONAL SCENE I.** (Lecture)
National development, technology assessment and the quality of life.
Environmental education of the public; programmes in U.S. and Europe.

INVITED LEADERS IN ENVIRONMENTAL AFFAIRS.
The following have accepted our invitation to take part in this session.
Dr. E. H. M. Ealey, Co-ordinator, Master of Environment Science Course, Monash University.
Dr. W. J. McG. Tegart, Melbourne Research Laboratories, The Broken Hill Proprietary Co. Ltd.
F. Smith, Senior Air Quality Officer, Environment Protection Authority, Victoria.
K. Tarrant, Director, Port Phillip Conservation Council.
Prof. G. Seddon, Director, Centre for Environmental Studies, University of Melbourne.

THURSDAY, JULY 18.

9.15 - 12.15 p.m. **THE INTERNATIONAL SCENE II.** (Lecture)
The United Nations Environment Programme.
The International Referral System.
The role of non-governmental organizations in national planning.
UNESCO and UNISIST.

1.45 - 4.45 p.m. **PRESENTATIONS BY WORKSHOP MEMBERS.**
Informal reports on field experiences, reports on information services being used and developed. Participants are asked to bring items which they have prepared solely for use in their own operations and which have not been published or widely distributed.

4.45 - 5.30 p.m. **Evaluation of the Workshop experience.**
Sherry Party.

THE INFORMATION USER

Small-group discussion: day one

Because of the great variety of information and data users in a cross disciplinary field, one is especially concerned with their background, orientation and specific information needs. Our collective experience with various user groups and their attitudes will add to our understanding of how to plan and use information resources.

Please discuss in your groups the following aspects:

1. What are some of the characteristic problems in assessing and evaluating user needs?
2. What can information users do to improve communications (both oral and written) between themselves and those who (a) produce, (b) handle information resources?
3. What can information professionals do to improve communications and services to users?
4. Any other problem you may want to add.

Each group should develop one major theme and related recommendations. This will make our discussion more manageable.

Discussion time: 1 hour 15-30 minutes.

Afterwards we will reassemble into the whole group.
Please select (a) a **reporter** and (b) a **secretary** for each small group.

The reporter will tell the whole group about the consensus of his/her small group.

The secretary will make an informal summary of the discussion and record problems and recommendations in addition to the major theme developed by his/her small group.

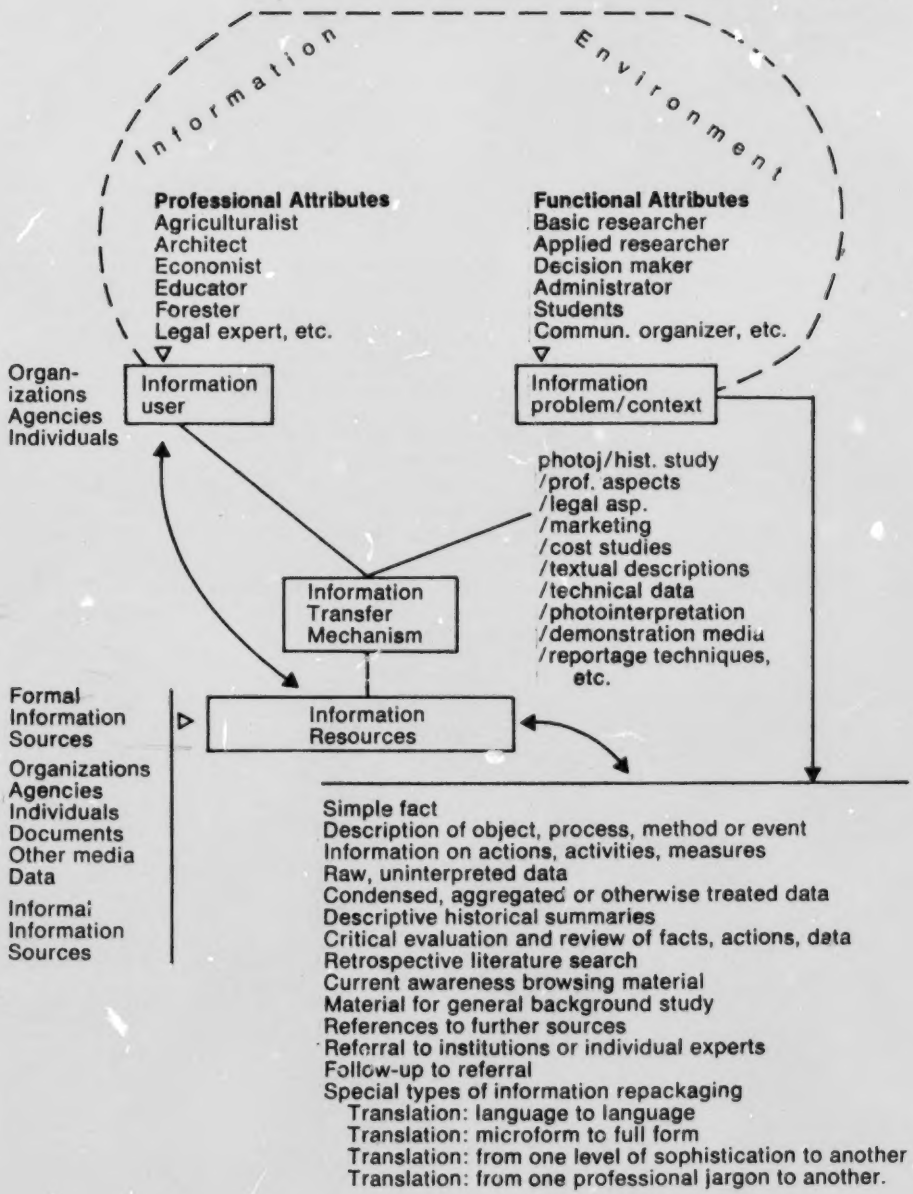
This will allow us to become aware of a great variety of problems and alternative solutions.

The following tables were used to assist discussion during the day one programme on information use studies.

Table 1 **INFORMATION PRODUCTS**

INSTITUTIONAL		INDIVIDUAL	
INFORMATION PRODUCTS	**MOTIVES AND CONSTRAINTS**	**INFORMATION PRODUCTS**	**MOTIVES AND CONSTRAINTS**
Agency history/ archives	Economical/political parameters	Expertise	Creativity
Operational policies	Social environment	Ideas	Professional goals
Operational measures	Institutional goals, missions, tasks	Methods	Disciplinary goals
Strategies, plans	Tradition, custom, preference leadership, change agents	Processes	Research trends
Cost analyses	Legal, regulatory restrictions	Compounds	Influence by peers
Forecasts	Priorities set by sponsorship	Engineering designs	Status rewards
Internal communications	Internal priorities	Maps	Economic inventives
In-house staff manuals	External power groups	Field observations	Project support
Decisions	Internal power groups	Laboratory observations	Intergroup relations
Regulations	Agency competition	Research data	Leadership
Codes	Lack of information	Collection of samples	Priorities
Standards, specifications	Information overload	Collection of specimens	Technical know-how
Research data		Office files	Special skills
Indices of environmental quality		Document collection	Professional tradition
Environmental impact statements		Translation	Change orientation
Developmental plans		Statements, opinions	Need for individual privacy
Process descriptions		Letters, memoranda	Personal commitments
Patents		Lectures	Lack of information
External communications		Unpublished papers	Information overload
Press releases		Proposals	
Agreements		Special products	
Contracts		Information and oral communications	
Short-term projects, and programs		Human networks	
Committees, panels, task-forces		Invisible colleges	
Conferences, meetings, symposia (Video conferences)		Formal publications	
Training and educational programs			
information systems			

Table 2 **INFORMATION TRANSFER MECHANISM**



A COMMUNITY NETWORK FOR ENVIRONMENTAL INFORMATION

Case Study and small group discussion: day two.

Your community has been selected by the 'Victorian Information Planning Board' to serve as a model for the development of a co-operative environmental information network. The community received a grant to plan and design ways of co-operation to interlink existing institutions, agencies, organizations, libraries and other information facilities. The objectives are (1) to consider the total information flow in the community between sources of information and the users and (2) to innovate and strengthen existing facilities rather than create a new system.

The information facilities of the community have to submit proposals to the Board outlining and justifying their own role in the prospective network.

You are a member of a committee whose task is to receive and review proposals. This committee will have to study all types of agencies, organizations, and information centres and their role in the environmental network. Your task is to study and report to the Committee on the following:

1. To identify problems which currently stand in the way of effective co-operation, especially in regard to referral activities, (a) between all types of libraries and (b) between libraries and other agencies.
2. To recommend novel ways for interaction in order to co-ordinate, share and disseminate environmental information, both at the research and popular levels, for the benefit of the whole community.
3. Suggest ways this local system can be interlinked with a national and eventually with an international environmental information network.

SECTION B

Profile of the Workshop Coordinator

Marta L. Dosa, Associate Professor, School of Information Studies, Syracuse University. Bachelor's and Master's degrees from University of Budapest in comparative literature, Master's degree in Library Science, Syracuse University, Ph.D. in Library Science, University of Michigan. Freelance writer under the name *Leszlei*, with three published books; former mathematics and metallurgical librarian. Research and teaching activities centre on cross-disciplinary approaches to environmental information, governments and information, science and society. Research done in East and West Germany, published as *Libraries in the political scene*, Greenwood, 1974. NGO delegate at United Nations Environment Programme conferences; member of the North American Committee of NGOs Concerned with the Environment; lectured on 'Environmental information Systems' under the sponsorship of NATO/AGARD (Advisory Group for Aeronautics Research and Development) in Canada, Norway and Italy; consultant to government agencies, community organizations and university departments; chairman, Environmental Information Committee, Special Libraries Association; member, American Society for Information Science.

List of Participants

PATRICIA A. G. ALONSO
Map Curator (part time)
Centre for Environmental Studies
University of Melbourne
PARKVILLE, Vic. 3052. Tel: 345 1844
and also at —
State Library of Victoria,
Swanston Street
MELBOURNE, Vic. 3000. Tel: 663 4811
Ms. Alonso, co-editor of 'Directory of map collections in Australia', is organising 'Map Seminars for Specialists', three-day seminars for librarians, cartographers, social scientists, environmentalists, and professional researchers. These seminars, sponsored by the Library Association of Australia, are available for rental as a 'teaching package'.

COLIN BARRIE
Head
School of Art
Royal Melbourne Institute of Technology
124 La Trobe Street
MELBOURNE, Vic. 3000. Tel: 345 2822
Mr. Barrie's ongoing interests include design in the industrial and commercial environments and in the manufacturing industry.

ALAN R. BEASLEY
Public and Information Officer
Soil Conservation Authority
378 Cotham Road
KEW. Vic. 3107. Tel: 80 1381
As the officer-in-charge of the Publications and Information Section, Mr. Beasley's interests are in the presentation of information in the Authority's publications, in photographic services, and library facilities and services.

E. ANNE BEAUMONT
Information Scientist (Economics)
ACI Technical Library
550 Bourke Street
MELBOURNE, Vic. 3000. Tel: 60 0441
Ms. Beaumont is engaged in collection, analysis and collation of data for an inhouse computer data base used to produce fortnightly current awareness bulletins and a monthly commercial current awareness service, Commercial LISARD (Library and Information Service Automated Retrieval Data). The data base includes material on the environment as it relates to litter, packaging, solid waste disposal and pollution in general.

LOUIS JEAN BEENS
Information Officer
Information Services Section
Department of Environment and Conservation
P.O. Box 1937
CANBERRA, A.C.T. 2601. Tel: 48 7322
Mr. Beens is engaged in collection, analysis, and storage of data relating to the environment in Australia. He is working on a pilot study of data collection for the Northern Territory utilizing computer storage on a kilometre grid of diverse environmental information.

ANN BERMAN
Technical Officer
Environmental Protection Authority
240 Victoria Parade
EAST MELBOURNE, Vic. 3002. Tel: 418 1277

JULIA CARLING
Reader Services Librarian
Hargrave Library
Monash University
CLAYTON, Vic. 3168. Tel: 541 2621
Ms. Carling is involved in the building of the Hargrave Library's collection of materials in environmental science relating to the physical sciences and engineering.

DIANA CARR
Librarian
Town & Country Planning Board
235 Queen Street
MELBOURNE, Vic. 3000. Tel: 602 0111
The Board's library contains material on urban and regional planning, urban sociology, plans by consultants, land use studies, landscape architecture, civic design, recreation planning and conservation in Australia.

ELIZABETH CARVOSSO
Acquisitions Librarian
Central Library
CSIRO
314 Albert Street
EAST MELBOURNE, Vic. 3002. Tel: 419 1333

TAH WEN CHU
Lecturer
Department of Architecture and Building
University of Melbourne
PARKVILLE, Vic. 3052. Tel: 341 6441
Mr. Chu is working in the field of education of architects, builders and other workers in the built environment.

IAN A. CRUMP
Information Officer
CSIRO Information Service
314 Albert Street
EAST MELBOURNE, Vic. 3168. Tel: 419 1333
Mr. Crump works with CSIRO's SDI and current awareness services, and is assisting in the creation of an 'environmental data base' by amalgamating subsets of the already operating commercial data bases.

PENNY CUTLER
Reference Librarian
Preston Institute of Technology
Plenty Road
BUNDOORA, Vic. 3083. Tel: 467 3211
Ms. Cutler provides reader services to PIT's Environmental Studies course which covers principles of ecology, local and global effects of use and abuse of fertilizers, limits to growth, recycling, the energy problem, effects of urbanization and air and water pollution.

MARI DAVIS
Research Fellow
Centre for Environmental Studies
University of Melbourne
PARKVILLE, Vic. 3052. Tel: 341 7062
Ms. Davis's interests are in the transference of information from the idea generating stage through to its use in the decision making process, especially in the field of environmental information.

PAM GIBSON
Senior Librarian
State College of Victoria at Melbourne
Swanston Street
CARLTON, Vic. 3053. Tel: 347 5122

AGNES GREGORY
Special Services Librarian
Swinburne College of Technology
John Street
HAWTHORN, Vic. 3122. Tel: 81 0301
Ms. Gregory's work at Swinburne relates to collection building and information support for teaching programmes and research.

GORDON GRIFFIN
Reference Librarian
State Library of Tasmania
Murray Street
HOBART, Tas. 7000

JOYCE GROOM
Reference Librarian
Royal Melbourne Institute of Technology
Central Library
368 Swanston Street
MELBOURNE, Vic. 3000. Tel: 341 2445

DR. B. V. HAMON
Senior Principal Research Scientist
CSIRO
Division of Fisheries and Oceanography
P.O. Box 21
CRONULLA, N.S.W. 2230

BARBARA HYNAM
Librarian
Petroleum Information Bureau
227 Collins Street
MELBOURNE, Vic. 3000. Tel: 63 2756
Ms. Hynam indicates that the PIB library has materials on air, water and noise pollution, lead in petrol and the oil industry in general. Inquiries from the public interested in environmental matters are welcomed.

WINSTON LAU
Principal Air Quality Officer
Special Studies
Environment Protection Authority
240 Victoria Parade
EAST MELBOURNE, Vic. 3002. Tel: 419 3388
Mr. Lau's areas of interest are photochemical air pollution, motor vehicle emission control, control of emissions of hydrocarbons and odorous matter, and special air pollution problems.

JUNE McALPIN
Librarian
Ministry for Conservation
240 Victoria Parade
EAST MELBOURNE, Vic. 3002. Tel: 418 1403
Ms. McAlpin is providing library and reference services for the various bodies within the Ministry: Environment Protection Authority, Environment Protection Appeals Board, National Parks Service, Port Phillip Authority, Westernport Environmental Study, working in conjunction with the libraries of Fisheries and Wildlife Division and the Soil Conservation Authority. A current awareness service is provided for the Ministry by Ms. McAlpin on the incoming periodicals, reports, monographs and microfiche and microfilm materials.

DIANNA McCLELLAN
Reference Librarian
La Trobe University
BUNDOORA, Vic. 3083. Tel: 478 3122

PENELOPE MORRIS
Architect
Department of Housing and Construction (Federal)
17 Yarra Street
HAWTHORN, Vic. 3122. Tel: 81 0271
Ms. Morris is involved with the development of the Australian Government's environmental impact policy and those of the State governments. She assists with preparation of environmental and feasibility studies on various government proposals. She also lectures to regional departments and outside groups on environmental policy and the implementation of environmental impact statements.

JULIANNE NEW
Librarian
Research Department
State Library of Victoria
Swanston Street
MELBOURNE, Vic. 3000. Tel: 663 4811
Ms. New assists in the overall reference and research services of the State Library which is the legal deposit centre for Victoria for all published material in the State.

GAIL OSWELL
Librarian and Information Officer
Australian Conservation Foundation
206 Clarendon Street
EAST MELBOURNE, Vic. 3002. Tel: 419 3366
Ms. Oswell provides library and information services for the Foundation's work. She is interested in classification systems for environmental materials.

A. J. E. PARK
Research Ecologist
Port Phillip Authority
480 Collins Street
MELBOURNE, Vic. 3000. Tel: 62 4811
Mr. Park is directing a study on foreshore vegetation at Seaford, Victoria. The results will have botanical and management significance to foreshore areas of Port Phillip Bay similar to Seaford.

TREVOR PEARCE
Officer-in-Charge
Environmental Studies Section
Arthur Rylah Institute for Environmental Research
Fisheries and Wildlife Division
Ministry for Conservation
Brown Street
HEIDELBERG, Vic. 3084. Tel: 459 2900
Mr. Pearce's work includes investigation into marine, freshwater and terrestrial pollution with persistent pesticides, metals and other toxicants.

PETER RAWLINSON
Lecturer
Zoology Department
La Trobe University
BUNDOORA, Vic. 3083. Tel: 479 2244
Mr. Rawlinson is interested in education and attitudes towards environmental issues in Australia. His research interest is the biogeography and ecology of SE Australian reptile fauna.

DR. GARY H. SCOTT
Lecturer
Chemistry Department
State College of Victoria at Melbourne
Swanston Street
CARLTON, Vic. 3053. Tel: 347 5122
Dr. Scott lectures in the College's environmental science programme. He is assisting in the development of an environmental information section in the College Library.

JOHN ANTHONY SHAW
Principal Research Officer
Department of the Environment and Conservation
P.O. Box 1937
CANBERRA, A.C.T. Tel: 48 7322
Mr. Shaw's field of interest and activity includes water and soil resource management, national water policy, water resources project appraisal, water resources research inventory, water research fund administration, secretarial activities for the Australian Water Resources Council, and multi-objective planning.

LEONIE M. SKEHAN
Manager
Information Services
P.A. Management Consultants
221 Miller Street
NORTH SYDNEY, N.S.W. 2060. Tel: 929 7888
Ms. Skehan conducts information services for the firm's various consulting groups in environmental services, urban and regional development and tourism and recreation.

JANET SMITH
Chief Cataloguer
Parliamentary Library
Parliament House
CANBERRA, A.C.T. 2600. Tel: 72 6308
Ms. Smith is interested in the establishment of an information network for material on the urban environment.

MARGARET TRASK
Senior Lecturer
School of Librarianship
University of New South Wales
P.O. Box 1
KENSINGTON, N.S.W. 2033. Tel: 663 0351

MICHAEL WATSON
Research Liaison Officer
National Parks Service
Ministry for Conservation
EAST MELBOURNE, Vic. 3002. Tel: 419 3388

SANDRA YOUNG
Librarian
Arthur Rylah Institute for Environmental Research
Fisheries and Wildlife Division
Ministry for Conservation
Brown Street
HEIDELBERG, Vic. 3083. Tel: 459 2900

SECTION C

REFLECTIONS ON THE WORKSHOP

Maria L. Dosa

The Workshop in Environmental Information Systems, sponsored by the Royal Melbourne Institute of Technology and held July 15-18, 1974, in Melbourne, could have used as its motto: 'Dedicated to a new concept of man based on increased knowledge of his complex and shifting needs'.[1] Increased knowledge as interpreted by the workshop design, meant increased awareness of information sharing and communication needs and the pooling of environmental information resources, rather than specific and technical solutions to problems.

What is the 'environment'?

The Victorian Environment Protection Act defines the environment as follows:

> The physical factors of the surroundings of human beings include the land, water, atmosphere, climate, sound, odours, tastes, the biological factors of animals and plants and the social factor of aesthetics.[2]

For the purposes of the Workshop, another dimension of this definition emerged, the dimension of human behaviour, attitudes and communication. This re-interpretation of the concept was probably presumptuous but unavoidable. It was based on the belief that inter-relationships and modes of interaction among people influence their perceptions and decisions as much as physical, biological and social factors. This view was reinforced by the publication *The politics of finding out: environmental problems in Australia*, in which Peter Ellyard quoted Aurelio Peccei, the initiator of the Club of Rome:

> Peccei has pointed out that the environment depends upon the point from which you view it. He describes the world as a system with four major interconnected variables: man, nature, technology and society . . . Peccei defined the 'environment' in a functional way in terms of this interconnected system: 'each subsystem or system is contained in a system of higher order, *which represents its environment*'. All systems, besides over-lapping here or there, are linked directly or indirectly by relations of inter-dependence.[3]

Peccei's concept of the 'environment' may be studied in the context of any one of the separate relationships between *man* and the other components of the system Peccei had envisioned:

(a) In the framework of the *man-nature* relationship, we think of the great body of thought and literature developed around the historical balance between human beings and the natural environment, and the controversy over the effects of Judeo-Christian philosophy and attitudes of modern civilisation. Proponents of this emphasis advocate ethical and philosophical regeneration.

(b) The *man-society* inter-relation conjures up the entire volume of scholarship dedicated to theories of the social environment, and the concerns of social scientists with increasingly detrimental effects of social complexity and uncertainty. Those who are motivated by this vision propose social redesign.

(c) In the *man-technology* correlation one perceives the dimension of the built environment and the price mankind pays

for progress that, in the view of many experts, is at the heart of the environmental conflict. Because of this concern, efforts in the industrialized countries to strengthen the role of technology assessment and to introduce new approaches to planning and environmental design have been widespread.

Each of these problem areas evokes the pessimism so characteristic of environmental literature. Seeing them as a system, one is reminded of the words collectively spoken by the Club of Rome Executive Committee:

> Our present situation is so complex and is so much a reflection of man's multiple activities . . . that no combination of purely technical, economic, or legal measures and devices can bring substantial improvement.[4]

Although these words were aimed at population growth, they are certainly applicable to the entire range of environmental problems. Although not all of us are ready to accept this stance of despair, none of us can escape the implications of collective and individual responsibility. In spite of their inherent fallacies, technical, economic and legal measures must still be designed according to the best professional judgements of experts. But it also must be acknowledged that these measures, even if introduced, may be infinitely weakened, or even subverted, by the behaviour and attitudes of people who have to live by them in order to make them work. Thus, a new vision of a relationship emerges and forces itself into the focus of the Peccei system of man-nature-technology-society inter-dependence, the relationship of *individual to individual*. Even if the complexity of the human condition is such that no combination of currently offered solutions invites trust and hope, man still has the responsibility to make this complexity livable for himself and others, and to work with utmost determination for ways of improvement. These ways, some of us believe, lie in the collaborative mobilization of talent, the development of knowledge-pools, and their utilization by the creative interaction of people.

Approaches to 'information'.

Broadly speaking, there are two fundamental approaches to information, largely dependent on the point of view of the individual. Although these two are not mutually exclusive, they are powerful enough to stamp their characteristics on any discussion of the topic. One view considers information primarily as a *commodity*, the other sees it as a *process*. The Workshop was founded on the latter emphasis. This stemmed from the belief that even the most sophisticated information resources — information analysis centres, libraries, data banks, etc. — remain unexploited unless inter-linked with each other and people who have potential need for them. The role of communication in the identification and sharing of information resources was the concern to which most of our sessions were devoted.

We thought of environmental information as the process that (a) transfers data from source to user, in any field of knowledge or activity applied to environmental problem solving. (b) transforms data into evaluated and synthetized information in the

context of a specific need, and (c) creates new insights and knowledge as it is fused with human experience and talent.

Why this concern with information, one may ask? Is it really potent and indispensable as a resource? Does it have any role in the political decision-making process? Does it really make any difference? To some extent it was the global environmental movement that discovered the answers to these questions. Environmentalists, communities and large segments of the public discovered that well-marshalled information can provide stronger support for a cause, and more input into decision-making. Some groups, in fact, discovered that information can create a considerable power-base.

This potential power, inherent to shrewdly used information, begins to worry some minds. The kind of individual who is concerned with the balance of scientific advancement, political utility and value judgements has traditionally been sensitive to both the benefits and dangers of information flow. Awareness of the global nature of environmental decision-making and management only heightened this sensitivity. The realization of interdependence made it only too clear that one man's decision about how to use information, and for what purpose, always affects somebody else. The more efficient the operation of data bases, the more possibility exists for their exploitation by self-interests that are alien to environmental concerns. T. S. Eliot said it quite simply and forcefully: 'We can never design systems so perfectly that no man needs to be good'.[5]

Who are the 'users' of environmental information?

The Workshop aimed at being 'user' oriented. An OECD forecasting study, *Information in 1985*, stated that scientific and technical information is generally interpreted in one of three ways: (a) as the output and input of scientific research and development, and thus of concern mainly to the scientific community, (b) as knowledge supporting not only the scientific and technical sectors but other societal activities relating to training, education, culture, mass media and others, (c) as a vital resource for the entire range of human activities, intellectual and material.[6] It was the latter holistic view that determined the scope of information use as we referred to it in the Workshop discussions. Thus scientific researchers, technologists, policy planners, managers, legislators, social scientists, artists, planners, architects, educators, students, public interest groups and all others were seen as potential users. Wouldn't these diverse information needs, we asked, be better filled by the systematic sharing of resources and by innovative arrangements for information request switching, referral and follow-up, rather than by the current pattern of piece-meal services? Isn't it precisely because of information barriers that experts have to deplore the lack of communication between professional communities? D. M. Lamberton commented on the lack: 'I looked at the recent STISEC report more or less as a case study. Perhaps the Committee membership reflects that lack of communication between the economics and information communities that I deplored

earlier.'[7]

Will the dramatic increase in information technology, predicted by economists across the international scene, satisfy the growing cross-disciplinary information demand? The OECD study puts forth, as one of its first points of diagnosis: 'The decade 1980-90 will be inevitably a period of *revolutionary change*, since a host of technological innovations will make desirable, and economically feasible, the automation of information on a massive scale — probably from 1978'.[8] How will data in socio-scientific problem areas, such as environment, be treated in this scenario? Predictions based on Delphi surveys of several hundred experts indicate that the giant data banks and information analysis centres of the not-so-distant future will be 'organised by branch and/or speciality'.[9] This projection has crucial implications for the environmental field.

The role of human communication.

In the light of the OECD forecast, what strategies will interlink these separate specialized data bases with each other and potential users? Will linkage occur only at the technical level, or will it penetrate the domain of interpersonal information exchange? Experts seem to have no doubt that the technological solutions will be available. On the other hand, scholars of human nature and personality point to a trend of alienation and isolation of the individual. This latter trend, then, may be expected to run a course opposite to technical developments, unless emphatic attention is devoted to human linkages. Specialized networks will be of no consequence to people concerned with the environment or other cross-disciplinary areas, unless information professionals are trained to:

- establish cooperation and sharing within and among the multifarious institutions that both produce and utilize information,
- create ways for increasing communication between these institutions and the public,
- constantly assess barriers of communication, diagnose problems and identify alternative channels for the economical and effective use of information resources,
- be knowledgeable about the role of the 'invisible college' in information sharing and use its pattern in more formalized but still individual-oriented ways, including the development of resource inventories and referral networks,
- understand specific problems in interpersonal information exchange, such as questions of privacy, proprietary rights, personal motivations, and constraints of economic, legal, and psychological considerations,
- develop a 'systems thinking' that would enable them to see all these component issues in an interrelated way,
- operate at the 'cutting edge' of communication research to be aware of new insights into interpersonal relations as well as the implications of manipulating minds,
- handle information transfer in the light of disparate national and cultural needs.

Although these objectives are too diverse and demanding to be interwoven in the design of a short-term Workshop, they were acknowledged by the discussion topics, as well as by the climate the Workshop created. Most of the participants shared the belief that only by open communication among institutions, disciplines and individuals, will information, derived from separate specialized sources, become integrated into a knowledge pool that can be used by the entire community. Only by utmost efforts for tolerance for the views of others will the words of Stephen Boyden strike home in reality:

> Our ability to understand the [environmental] situation in a comprehensive way, and to overcome the threats to the survival of our species, depends on the extent to which we prove ourselves capable of bringing together the knowledge acquired in many different academic disciplines, spanning across the natural sciences, social sciences, and the humanities, and of using this knowledge creatively and with imagination in the true interest of humanity.[10]

The need for information sharing.

Some of the characteristics of the environmental field make it especially crucial that concerned individuals from all backgrounds merge their efforts. These characteristics include:

- the cross-disciplinary nature of research and activities,
- diversity of diagnosed ills and proposed solutions,
- influence of individual value systems and beliefs,
- a certain crisis atmosphere that may be diffused by a new crisis,
- vulnerability of human emotions to political manipulation,
- conflicting interests of social groups,
- scattering of economic resources that would make studies and their wide distribution feasible,
- lack of models for studying problems in certain sub-fields such as environmental psychology, behaviour, communication and education,
- lack of data for social indicators related to the quality of life,
- lack of consensus on priorities,
- lack of awareness of existing data,
- lack of agreement on what data should be collected and in what form,
- lack of socially-based guidelines on what sources and categories of data should be available to whom and through what channels.

In the light of the above listed characteristics of the environmental field, individuals working in isolation and lacking the mutually reinforcing climate of easy information flow, may find that:

- they are trapped within the perspective of their own institution's particular goals and interests, their own specific educational background and the rigidity of a day-by-day institutional and professional operation,
- they don't have enough basis to perceive the effect of their

own decisions and products (whether these are in the form of research results, laws, regulations, manufactured goods or services delivered to various publics) on other institutions and individuals,
— they don't have access to sufficient data with predictive value that would enable them to assess the future effect of their current planning and development on the environment,
— in programs that require the input of several disciplines and knowledge bases, they don't have sufficient awareness of the potential of fields beyond their own, nor do they have familiarity with other professional methodologies and approaches,
— often costly efforts to bring their activities into concert with the current public interest in the quality of life appear wasteful, because either they collide head-on with the interests of other institutions and groups, or they are made vulnerable by isolation,
— at the personal level, it is difficult for them to assess the environmental impact of their own values and life styles in the context of collective environmental needs.

The danger is, that the absence of data and informed judgement exposes the individual to societal and group pressure. In the words of Sol Encel:

> Men do not merely react to an environmental situation. They make decisions which derive partly from reaction to external stimuli and partly from choice, and these choices are governed by needs, capacities, and attitudes which are highly structured by man's social environment.[11]

Objectives of the Workshop.

The Workshop was designed for professionals who wanted to (a) gain insight into the nature of the information transfer process related to the environment, (b) develop awareness of types of information user groups and resources, (c) have an opportunity to exchange ideas and views.

Immediate goals.

It was hoped that participants of the Workshop would:
— be representative of the diversity of interests, motivations and approaches that characterize the environmental field,
— discuss these differences and their common goals in a climate of mutual respect and tolerance,
— begin to work out ways to overcome barriers created by diverse backgrounds, perceptions and terminologies, and identify some of the scattered information resources,
— translate the implications of international developments in environmental information into the context of the Australian scene,
— lay the foundations for continued information sharing and cooperation in the future.

Long-term goals.

Even if four days were too short on which to build a future, we were optimistic. We hoped that:

— some of the individuals and groups within the Workshop would become the nucleus of new environment-oriented information alerting projects,
— participants would catalyse workshops or small, informal meetings in their own communities, with the purpose of environmental information sharing and discussion of new developments,
— duplication and waste of effort and resources could be avoided by interaction in the information process.

What lies ahead.

Institutions that have a mandate for environmental improvement will undoubtedly build up a multiplicity of data bases and will offer excellent services. Some experts will use these resources for their own institutional and professional goals. This use will be based on ad-hoc need and will utilize formalized channels. In the meantime, a great number of other information products will be developed, in the form of research reports, special studies, impact statements, government documents, conference proceedings, press releases, news bulletins, memoranda and others. These sources will be available mainly through the the 'invisible college'. The information-rich will become richer, and the information-poor will not even suspect what they have missed. There will be innumerable decisions based on economic or political constraints and maybe as many on emotion judgements.

Is this picture too bleak? It stems from the conviction that while technological developments in information networks will be fast and spectacular, improvement in interpersonal information exchange will struggle with increasing problems of complexity, information overload, lack of time to evaluate, lack of funds to initiate informal alerting programs. It will take utmost devotion and sacrifice to extend information sharing beyond one's immediate needs and interests. Information is a resource, as valuable as energy. Some people will not want to share the results of their work. On the other hand, information is also a process, and thus dependent on human behaviour and attitudes; in this awareness lies our hope for the future.

In the meantime, how do we come to grips with the realities of a deteriorating environment? How do we keep environmental problem areas free of political and personal bias? How can we integrate our own perceptions with the constantly changing landscape of societal movements? To what extent are we responsible for the state of the environment and each other? These are questions each of us must confront. If these lonely confrontations would be in small ways made more meaningful by the occasional sharing of ideas with each other, we would know that the

'individual-to individual' environmental relationship is not an empty phrase.

Looking back: a personal view.

Remembering the Workshop, I remember mainly people, faces, gestures, expressions, tone of voice, joint searching for a commonly acceptable style of discussions, cooperation, empathy. I would like to thank the participants and organisers all individually and personally. They made my Melbourne experience humanly and professionally meaningful. I would like to thank Jean Hagger, Head of the Department of Librarianship, Royal Melbourne Institute of Technology, for her expert and tireless efforts in initiating and organising the Workshop, Edward W. White, Manager, Education Services, Techisearch Limited, for the bibliography of resources and for his fine support expressed in so many ways. Thanks to the guest lecturers, who gave us freely their expertise and time, Dr. E. H. M. Ealey, Professor George Seddon, Frank Smith, Keith Tarrant and Dr. W. J. McG. Tegart. The combination of informality and depth of their presentations contributed a unique and valuable feature to our sessions. To D. H. Borchardt, Chief Librarian, La Trobe University, my sincere thanks go for having built the initial bridge between Syracuse and Melbourne. Patricia A. G. Alonso, Map Curator, State Library of Victoria, Mari Davis, Research Fellow, Centre for Environmental Studies, University of Melbourne, June McAlpin, Librarian, Ministry for Conservation, Gail Oswell, Librarian and Information Officer, Australian Conservation Foundation, and Dr. Anton Stavik, Lecturer, Department of Librarianship, RMIT, deserve special gratitude for their part in turning the idea of the Workshop into reality, and then making the reality a most pleasant one.

NOTES AND REFERENCES

1. BENNIS, W. G. and P. E. SLATER, *The temporary society*, New York, Harper & Row, 1968. p 58.
2. Victoria. Environmental Protection Authority. *The Environment Protection Act, what it means to you.* Melbourne [n.d.]. p 1.
3. PECCEI, Aurelio, Where are we? Where are we going? *Succesco,* February 1970, pp 119-22. Cited by Peter Ellyard, Environmental protection: government response to a complex issue, in DEMPSEY, R. *ed, The politics of finding out, environmental problems in Australia.* Melbourne, Cheshire, 1974. pp 240-241.
4. Club of Rome Executive Committee, Commentary, in MEADOWS, D. H. *et al, The limits to growth.* New York, Universe Books, 1972. p 196.
5. *op. cit.* BENNIS and SLATER, 1968, p 118, footnote.
6. ANDERLA, George. *Information in 1985, a forecasting study of information needs and resources.* Paris, Organisation for Economic Co-Operation and Development, 1973. p 7-8.
7. LAMBERTON, D. M. The necessity for a national information policy. In *Australian library journal,* 23: 215, July 1974.
8. *op. cit.* ANDERLA, 1973, p 125.
9. *op. cit.* ANDERLA, 1973, p 70.
10. BOYDEN, Stephen. Mankind in a changing environment. *Habitat,* 2 (2): 8, June 1974.
11. ENCEL, S., Planning for man's survival, in Macfarlane BURNET, *et al. Man and his Australian environment.* Melbourne, Ormond, 1973. p 78.

SECTION D

PROBLEMS AND SOLUTIONS: INDIVIDUAL VIEWPOINTS

The afternoon session of the third day was given over to the presentation of specific information problems and the solutions sought by people engaged in environmental research and study. The pith of each speaker's contribution, together with some pertinent questions from workshop participants, is presented here in the hope that the immediacy and interest of the discussions is conveyed.

Dr. E. H. M. EALEY, Co-ordinator, Master of Environmental Science Course, Monash University.

Ealey:

When I came to Melbourne, having knocked around the Antarctic and the desert in Western Australia for quite a bit of my life, I was appalled to find, after working at Monash for a time, that universities were turning out graduates with first class honours in science who did not have a clue about the real world. It was not only a matter of a too specialized education, but was also a matter of communications. The idea began to form in my mind that specialists in their own fields were achieving their own goals quite adequately, but they had no communication with anybody else. For example, engineers can build a perfect dam, but in the wrong valley! I organised a unit for Zoology Honours students, *Applied Ecology & Conservation*. This put them in touch with practising resource managers. Engineering students became interested and this year 150 enrolled in the unit. Experience in this unit led to the setting up of a postgraduate degree. I have acted as a co-ordinator to draw skills of specialists within the university and from outside it, into devising courses especially for the Master of Environmental Science programme at Monash University. In some cases staff members agreed to take candidates into existing third-year units and thus placed on themselves a heavier workload. The co-operation has been extraordinarily good and has increased after contact with motivated students. The aim of this course was to convert candidates to a new way of thinking, to go beyond the confines of their disciplines and to search for overall views, to take courage to learn new skills, new methods and approaches.

The graduate programme of environmental science has been designed for several purposes:

1. to enable a student to continue his studies at a postgraduate level within the area of his interest and previous training.
2. to enable a student to broaden his experience and awareness by taking units at graduate and undergraduate levels which are relevant to the aims of conservation of the environment, resource management and environmental planning.
3. to enable a student to work and communicate with staff and other students who hold degrees in a diversity of disciplines.
4. to give the student the experience of carrying out a research project on an environmental problem.
5. to face the student with the task of assessing and integrating results of studies conducted by persons from widely diverse disciplines.

Although students with different backgrounds may be required to undertake certain units, the following list indicates many of the units which are available. These units are presented by various faculties and departments throughout the University.

Basic Ecology
Basic Chemistry
Applied Ecology and Conservation
Environmental Psychology
Decision Processes in Groups & Society
Selected Studies in Meteorology and Climatology
Resources Evaluation and Management
Coastal Environments
Recreational Geography
Wildlife Management
Quantitative Plant Ecology
Stability in Ecosystems Models
Environmental Geology
Radioactivity
Chemistry of Recovery Processes from Waste
Microbiology
Biodegradability
Environmental Change, Genetics and Evolution
Waste Water Treatment
Water & Transport Engineering
Water Resources Engineering
Planning & Building Technology
Environmental Acoustics
Environmental Fluid Mechanics — Estuarine Dynamics
Air Pollution
Atmospheric Chemistry
Victorian Vegetation
The Marine Environment
Limnology
Science Education — Social Aspects
Law and the Environment
Society and the Environment
Urban Sociology
Socio-Ecology
Sociology of Alternatives and the Future
Introduction to Environmental Economics
Environmental Economics

Candidates must either have or obtain during the course competence in Chemistry, Ecology, Economics, Law and one Engineering unit. Engineers who have trouble with Ecology or, for instance, Sociologists who need help with Mathematics for an Engineering unit, are given special tutorials, but the standard for the unit is not lowered to allow for their lack of background. Nevertheless, they usually pass. At present there are 44 part-time and 22 full-time candidates enrolled.

In addition, I have been conducting an adult education course which I find extremely interesting. There is a lack of communication within the community; it is hard for a community to find out about plans, or to know where to get information. The course is twelve lectures briefly covering basic ecology and touching on land use, air pollution, water resources and their use, the marine

environment and any other specific topic which is brought up during the course. I find that my methods for getting information are not always through orthodox channels, but often by using the telephone to contact someone directly who is working on a particular aspect, or by contacting a colleague in the university or elsewhere. This class has at times exceeded one hundred people of diverse occupations — farmers, engineers, lawyers, doctors, students, housewives. Some of them come long distances to attend. These people, if they wish to question a proposed plan, will know what sorts of information to seek and get a factual basis for any action they see as necessary. Very few activists (certainly none of the vocal ones) enrol in any of my courses. Some I know certainly do not wish to be 'confused by facts'. However, the candidates who have enrolled are mainly highly motivated and claim to gain a lot from the courses in the form of changed attitudes as well as information.

Dr. W. J. McG. TEGART, Melbourne Research Laboratories, The Broken Hill Proprietary Co. Ltd.

Tegart:

I want to talk about the setting up of an information retrieval system which was used in a number of our company's production centres to solve a common pollution problem. The need for such an information system arose because the centres involved had limited staff and library facilities and were remote from access to conventional information sources, and technical and academic journal literature. The problem was basically a pollution problem. Raw materials, coming into a plant, were being processed resulting in a finished product plus a waste product which may or may not be a pollutant. A committee was brought together to look at the problem. The first thing we discovered was the lack of information on the processing system itself, the pickling of steel. We talked to the representatives from the various centres and we learned that the information we needed was of two different categories. First, we learned that most of the centres didn't know enough about the key parameters of their own process. They wanted information about their current systems so they could monitor them and produce data, particularly on the quantity of waste they were producing. By understanding the process better they might be able to reduce the quantities of waste produced. The result would be an important initial step in the whole problem of abating the pollution situation. Secondly, information was needed which would help to solve or eliminate the problem completely. To do this we set up a number of objectives to guide the information search activities. The objectives were three in number:

1. to change the raw materials and the process so as to reduce the pollutants to an acceptable level with the minimum cost or expenditure;
2. to reduce the raw materials, thus changing the process, and maximise the return on expenditure;
3. to solve the problem by turning the waste into commercial material thus gaining complete return on our investment.

The particular process, the pickling of steel, with the inputs of steel and acid, result in a finished product and a waste acid commonly known as 'pickle liquor'. The acids that are commonly used in this process are hydrochloric and sulphuric acid. So, for example, if the plants wanted to improve their existing process they need to know more about the rates of pickling steel at different temperatures with different acid concentrations, the amount of fuel involved in the process etc. With the information system we devised, we hoped the plants would be able to examine their process and perhaps do something to optimise it and reduce the waste. We looked at alternatives to this process. Is there a way we could do away with acid pickling? Could we shot blast the material or could we pickle it in molten salts? Both of these latter processes have different sorts of waste products. We therefore included information on these wastes so that plant personnel could make an economic assessment of the various alternatives. Could we, in fact, leave the process unchanged and take on a waste treatment plant? Waste treatment plants themselves have different levels of sophistication. So that if we are, for example, using sulphuric acid, we can neutralise the acid to get a sludge which can be dumped, or we can treat that sludge in a certain way to turn it from a rather jelly-like mass into a solid product suitable for land fill. Alternatively, we can crystallise out ferrous-sulphate from the sludge and sell it as a chemical product. We needed to have in our system, therefore, information on land fill, information about markets for ferrous-sulphate and also some information of the economics of the sulphuric acid industry. By using hydrochloric acid in the pickling process, it is feasible to re-cycle the acid through the system, getting back hydrochloric acid and a very fine iron oxide. If this system were used, information about the economics of marketing iron oxide would be needed. If sulphuric acid is being used then from an environmentalist's point of view, say, the simple way would be to change over to hydrochloric acid, put in a re-cycling system and simply handle the iron oxide as a commercial product. However, it isn't quite as simple as it sounds; these two acids have quite different characteristics and require different types of tanks, pumps and machinery in the plant. So, into our information retrieval system we had to put in what was known about the engineering problems essential to the handling of these sorts of acids.

So what we needed was a large scale information system for the use of the people in the plants and for the committee, so that they might make an informed assessment of the situation. None of the existing information systems seemed suitable to our purpose, so we set about generating our own information system. This was done by two librarians and a scientist. The objectives of the system were to provide a bibliography of current literature on pickle liquor treatment, including legal and regulatory information where possible. The information was made accessible through subject and author indexes. The criteria we used for setting up the system was:

1. that it should be simple to use;
2. that it should be simple to up-date;
3. that it should be inexpensive

We opted for a system of plain cards and sheets rather than any complex or streamlined systems with punch cards, peep holes or other devices. The net result is a simple kit consisting of a box of cards which is an author index, a diagram sheet which shows the process identifying various areas in it with a series of letter identifiers, plus a folder containing all the published papers. The papers are cross-indexed on the cards in the box. A numerical index and a subject index plus an index of company reports, was included in the 'package' so that the system could be handed to somebody outside the organisation, after taking out reports which we considered to be confidential. General articles from news magazines, the daily press and trade journals were also included. Because of the wide nature of the subject, the information materials were divided into two groups: (1) information on pickle liquor treatment; (2) information on the more general aspects associated with pickle liquor, like water pollution, solid waste disposal, aspects of legislation and technology in other areas that might be applicable.

The system appeared to work very well for its limited life. I think it is an interesting system, because it was aimed at communication to a lower level in the organisation than to the rather more sophisticated level of scientists and librarians. We attempted to reach the people in the plants, by giving them sufficient information for them to understand their own plant and processes.

Oswell:
Do you continue to put new information into the retrieval system and keep it up to date.

Tegart:
Unfortunately the system had a very limited life and our incentive to update it is very small because by now our plants have utilized the information it contained.

Skehan:
Did the scientists and librarians working on this pickle liquor information system evaluate the material in any way.

Tegart:
Not really, we stuffed into the system as much information as we could find.

Scott:
Was there any feedback from the plants on the usefulness or otherwise of the material.

Tegart:
A number of criticisms and suggestions were offered but we didn't get a great deal of feed back. It was being used primarily in the plants by people who do not have the scientific background to critically examine and evaluate this kind of information. There is perhaps some material which could be culled now from the system.

FRANK SMITH, Senior Air Quality Officer, Environment Protection Authority.

Smith:

I will start in the traditional way by pointing out that as a public servant, I will be describing my own personal views, which don't necessarily coincide with the official ones. And also I'll be treating environmental information more as a two way process between the community and the government agency.

I find, with some feeling of sadness, that there is not in fact as free a disclosure of information as one would like to see, of research in progress, in universities, in government institutions and in industry. In fact, even more saddening is the attitude in certain areas that information is a weapon — and, of course, it certainly is but that smacks a little too much of medieval superstition for my taste. I believe that in the interests of the public and the environment and of government and industry in the long run, that free access to information on waste discharges, so that it can be publicised and openly debated, is of far more importance than perhaps questionable considerations of commercial secrecy. If you keep people in the dark, they will begin sooner or later to thrash around, perhaps violently, looking for the light switch. Now there are serious difficulties in the way of making *all* the information available to *all* people and I realise that only too well. But I feel that it is important that this be attempted. We have the Pentagon Papers as a good example of what can happen if you don't start practising reasonably free disclosure. 'Whistle blowing' where a person inside the security fence of government or industry can't stand to see important information suppressed any longer, and discloses it to the press is a practice that, in my experience, is growing and probably can be expected to grow even further. I don't find this at all an edifying spectacle and it does no one any good, except the newspapers and they sell rather more of those. And I am quite certain that no one would feel that that is the way the environmental situation should be handled. Now, I think perhaps free disclosure of information involves most of all the motivation of people who can read and record and file and disseminate information. In some cases, lack of proper library facilities has engendered perhaps overmuch reliance on personal filing systems with all their gaps and inherent failures, and on professional and personal contacts, both of which tend to be rather jealously guarded.

As a government institution, the Environment Protection Authority has a statutory obligation to publish reports and information and to provide information and education to the public. And of course, we are looking for input from the community, as well as giving information to the public. Problems arise because of restrictions on some types of information. Other problems arise when people come to us with their plans for the future and ask if they will pass muster. A lot of time and money can be committed on the basis of some sort of quasi-decision arrived at in informal discussions where the public can't see the process of decision making.

I think perhaps the most significant problem that we have at the present time is the question of information on what is being discharged. Clearly, the way the law is written, the person who wishes to apply for a license to discharge waste has to know what he is discharging. How does he know? The E.P.A. is looking at, or thinking about, the possibilities of licensing consultants on discharged wastes who would be subject to some sort of penalty for writing false information. It is a very difficult thing to decide whether the information being supplied is in good faith, or not. There are all sorts of shades of grey here; the question of verifying the information upon which people are allowed to operate in a certain way involves a great deal of man hours.

Another important area is the problem of information flow associated with planning. Perhaps things weren't too good in the past, but are they really going to be all that much better in the future? One day somebody is going to add up the cost of producing plans that were knocked by predictable public opposition. We have seen the effects of protests, notably the Yarra River Conservation action which started because of a small group who rallied together in 1958. I think these sorts of protest must be seen as misplaced data inputs. If there are protests, then there are inputs the planner neglected to consider, because either it wasn't laid down in the brief to consider the public's view, or the planner just didn't think that these people were important enough.

Carling:
When you are issuing a license for discharging wastes do you take the information from that particular company or person who is asking for the license, and if so, how do you verify that information? Or does the company employ a chemist who says these are the substances coming out of our discharge pipes?

Smith:
We certainly don't take the information at face value; it is certainly investigated, although in many cases, it is very difficult to verify and the ultimate responsibility is on the person supplying the information. We have had at times some completely ridiculous estimates of what the discharge ought to be, but we have nearly always been able to resolve this with the people concerned.

Rawlinson:
Does the E.P.A. get information on discharges made by government departments and do you treat it in the same way as information from industry.

Smith:
The answer is yes.

KEITH TARRANT, Executive Director, Port Phillip Conservation Council.

Tarrant:
My role is executive director of the Port Phillip Conservation Council (P.P.C.C.), a voluntary group of some twenty conserva-

tion organisations around Port Phillip Bay. Currently the Council has under consideration conservation issues of major or minor degree, ranging from a scout boat shed on Table Rock at Beaumaris to the Newport Power Station at Williamstown. When an issue comes up, we are often in a position of not having all the technical information available needed to assess the particular issue. For instance, the issue of the Newport Power Station covers everything from hydraulics, geography, air pollution control, right through to medical evidence of the effect ozone and hydrogen oxides might have on the breathing of the people of Melbourne. I happen to be the only — or the only person I know — working actively on conservation full time, aside from the A.C.F. I am associating with people in universities, in government departments and with researchers working on various aspects of conservation. But the information generated by these institutions is not being presented to the public or the government in the manner that the P.P.C.C. feels is necessary, to get some action from the politicians.

The great difficulty is that much information deposited in libraries, government offices and the like would be invaluable to us if we knew how to get it or even knew it was there. I do, from time to time, call on the Librarian at the Australian Conservation Foundation to collect as much as she can on a certain subject. There is probably quite a lot of information available that we as a group don't know about. We utilize an informal communication network of people such as Frank Smith of the Victorian E.P.A., Dr. Bird of the Geography Department at Melbourne, Dr. E. H. Ealey of Monash University and Dr. R. Birrell of the Anthropology and Sociology Department at Monash University. Dr. Birrell has done a sociological study of the Port Phillip Bay area, which he and the Port Phillip Conservation Council have jointly published as a report called *Port Phillip Bay: The Case for Alarm.*

The way we work is by using people in the field for information. If you don't know somebody that has the information you want, then you are in the position of making off the cuff statements, taking the philosophical view of the whole thing and making subjective value judgements. The Council has been accused from time to time of not researching the issues properly before we hit the press or the media. This is quite right and it is a valid criticism. But nine times out of ten when we are able to research it later, we find our early statements were right. You must remember that on many of these issues we cannot wait till information is collected. If we spent enough time to conduct research it would be too late and this is our problem. We have to make a value judgement on what we know. I have a background in communications engineering which gives me a fairly broad knowledge of the various engineering fields, so I am able to assess things as an engineer. However I don't make categorical statements unless I am quite sure. I say this *could* happen or that *could* happen. The Council works from a background of previous issues, particularly in Port Phillip Bay. There are many examples of the different kinds of damage man has

done to his environment around the Bay.

What I would like to see is some sort of inventory on all the information available relevant to the environment. This would be a mammoth task because the environment covers a large field, practically every discipline presently operating in any of the learning institutions. The Minister of the Environment and Conservation in Canberra, Dr. Moss Cass, tells me that they are planning to set up a computerised inventory of information. This, of course, will take several years to be fully operational.

Dosa:
We talked earlier about the setting up of this inventory of information. Louis, would you care to say a word about the plans of the Department of the Environment and Conservation?

Beens:
The Department is looking into the setting up of an environmental data base, joined in with U.N.E.P.'s International Referral System. This inventory will consist of a register of environmental organisations in Australia, a register of regular environmental data services, a register of environmental law and its applications, and a register of environmental communicators and experts. Other areas are being discussed for inclusion in the information service. The Department will work more or less as a clearing house for environmental information and research.

Tarrant:
Let me illustrate our information needs with a current example of an expanding issue, the Newport Power Station. We started off with the thought: 'fancy putting a power station right in the middle of a residential area'. We progressed to questioning the aesthetic effect a 615 ft. chimney would have on the surrounding areas. Then scientists and members of the Williamstown Conservation Planning Society started looking at the question of air pollution, water pollution, thermal pollution, the effects retaining walls would have on Greenwich Bay and so on. Then we got on to medical people who put together more information. We then saw the issue as an environmental disaster. But the S.E.C. and the government had already made decisions about the power station. With pressure from the P.P.C.C., the E.P.A. enquiry was set into motion and since then we have been going through the processes of a political and legal fight against the construction of this power station. Now we have reached this stage, the Environment Protection Appeals Court and the federal government are, in fact, giving us a loan to fight this issue. And it was only after we got legal aid that we started to gather full information and gain the support of people with expert evidence that was necessary to really put up an informed fight.

Davis:
Having collected much valuable and convincing information to fight this issue with the voluntary efforts of the P.P.C.C., using 'old boy' network and the invisible college network of experts and scientists, you then gained official recognition, as it were, through the government grant of legal aid. Did you find that infor-

mation sources previously closed to you were now opened and that your information gathering tasks were easier?

Tarrant:
It eased it very considerably, because we were able to increase our manpower. We have engaged a firm of solicitors who had previously been working in their spare time, unpaid, until we obtained this legal aid. Immediately we got legal aid, we were able to brief counsel. We received the aid only three days before the appeal started. Counsel collected experts to give evidence for us. We gave them the names of people that we knew, and they were able to co-opt a lot more and this helped us tremendously. Once we had the legal aid, everybody was with us.

Crump:
The fact that you had better access to information, was it responsible for any significant swing from an emotional presentation to factual or detailed presentation?

Tarrant:
That's a good point — yes it was. With this appeal we have stuck strictly to factual, scientific information and relied on that. I think you must be objective about certain parts of an issue, you must have your facts right, but if you don't make an emotional approach, facts are never going to get anywhere. People very often don't listen to facts I find; I am talking about the general public in this context. They are more interested in what's going to happen, what the effect on them personally will be and the effect on them is seen often in emotional terms.

Dosa:
You are also engaged in environmental education. One of the most important aspects of education is to give people a certain sensitivity of how to balance the factual approach against the emotional one. Both are needed, but they are needed at different times, with different targets and with different intensity. How do you ever train people for this sort of skill or this sort of sensitivity?

Tarrant:
This is very difficult. My job is alerting the general public to the problem and then establishing the facts. The facts come later in argument.

Seddon:
I have a comment to make here. John Passmore, probably the most distinguished philosopher in Australia, has written a book recently called *Man's responsibility to nature* (Duckworth, 1974). He makes a number of important distinctions that are useful in discussions like these. The point that he makes is the distinction between a 'problem in ecology' and an 'ecological problem'. He says it is a slightly arbitrary distinction but it is a necessary one, however you choose to make it and he makes it thus: an *ecological problem* is a scientific problem whether or not it is easily soluble, it can be solved, by the methods of science. And he would, I guess, regard whether or not Newport will have such and such emissions

and whether or not these will have such and such biological effects and so on, as ecological problems. *Problems of ecology*, he considers not to be scientific problems at all, but a very special kind of social problem, because these then involve various kinds of value judgements. And I think one ought to distinguish these problems pretty sharply in discussions about Newport. The real problem is that a lot of these issues have not been distinguished adequately or clearly. The fundamental misfortune I think, here, is that the problem in ecology hasn't been canvassed; and it is not one, but a range of problems, one of which may or may not be an aesthetic one. I myself, don't see why it should be. I think that a power station at Newport could look magnificent; it depends on how it is designed. Just as I think the Empire State Building looks magnificent. Very large structures are not necessarily ugly; that is an absurd presumption. There is also a location problem and most town planners are rather in favour of a mix of urban and industrial uses for various reasons that I won't go into here. It tends to make short work journeys and gives a kind of variety too, which is generally better socially than strict segregation, where here you have a nasty industrial area with just rather underprivileged people like in Coburg and Footscray and there you have a residential area like Hawthorn, where it is all nice and clean. But the resource use problems, I think, ought to have been much more vigourously debated than they have and beyond those, others, like population policy problems, which really haven't been debated adequately at a political level in Australia at all. The provision of additional power at Newport is based essentially on the growth of population, a political issue, because natural increase in Australia is a minor component of population growth, and is substantially a product of direct migration.

The role of individuals in international movements

SECTION E

UNITED NATIONS ENVIRONMENT PROGRAMME:

INTERNATIONAL REFERRAL SYSTEM

Marta L. Dosa

With the facility of global communications, individuals and citizen groups need not feel that international movements are far removed, utopistic and beyond reach. This belief was expounded by experts in a March, 1974 issue of the *Annals of the American Academy of Political and Social Science,* edited by Donald M. Lamberton, Professor of Economics at the University of Queensland, Australia. In this publication Hazel Henderson, Director of several public-interest organisations in the United States, wrote:

> The rise of new participatory citizen movements for consumer and environmental protection, peace and social justice are grounded in an almost intuitive understanding of the persuasive power of information. In many affluent economies, such as those of Western Europe, the United States, Australia and Japan, the overarching strategy of these citizen movements has been to manipulate information and, in turn, to change prevailing views of what is rational.[1]

The contribution of non-governmental organisations (NGOs), scientific and professional associations and grass-root groups, is crucial for viable global planning for environmental improvement. Individuals can play an important role in this process. There are numerous channels for their input, such as their own research and professional organisations, international intergovernmental agencies, or specialised interdisciplinary programs. Examples include: Food and Agricultural Organisation of the UN; International Association against Noise; International Council of Scientific Unions; International Federation for Documentation; International Federation for Housing and Planning; International Federation of Social Workers; International Federation of University Women; International Ocean Institute; International Organisation of Consumers Unions; International Organisation on Water Pollution Research; International Planned Parenthood Federation; International Road Transport Union; International Student Union; International Union of Air Pollution Prevention Associations; International Union of Local Authorities; Union International des Architectes; Union of International Associations; UNESCO/UNISIST; World Confederation of Organisations of the Teaching Profession; World Federation of Engineering Organisations; World Health Organisation of the UN; World Wildlife Fund; others have been inventoried and described in several directories (see source list of directories, section G).

One of the most comprehensive plans for environmental information sharing is currently emerging under the sponsorship of the United Nations Environment Programme (UNEP). Since the UNEP-International Referral System has vital implications for all national, regional and local environmental groups, the following report describes its origin and plans.

UNEP is in the focus of environmentalists' attention because it seeks new ways for NGO co-operation in international planning. New arrangements for interaction have been long overdue.

As Margaret Mead said:

> The fact that a great number of non-governmental organisations were finally represented at Stockholm and succeeded in making a tremendous contribution to the climate of opinion within which the Conference succeeded, only emphasizes the fact that much better arrangements will need to be made in the future for open and free access to the secretariat of the Environment Programme and for all parts of the United Nations. Experience has shown that what we need is a network within which non-governmental organisations can communicate with each other, reinforce each other's programmes and plans and citizen support needed by the United Nations.[2]

International government and non-government organisations

The United Nations Environment Programme was established by the General Assembly on December 15, 1972. Resolution 2997 (XXVII) provided for a policy-making Governing Council of 58 member states (16 seats for Africa, 3 for Asia, 6 for Eastern Europe, 10 for Latin America, and 13 for Western Europe and other states[3]). The Governing Council is responsible for the co-ordination of the manifold, on-going environmental programs in the UN family (e.g., FAO's Soil Data Processing System, UNESCO's Man and the Biosphere Programme, WHO's International Reference Centre for Waste Disposal). Co-ordination of these programs with emerging ones is made difficult by their disparate characteristics, levels and forms of operation. Some are monitoring systems, others registries of research, and still others full-scale data banks.

The Environment Secretariat, headed by Maurice F. Strong of Canada, with headquarters in Nairobi, Kenya, is the first global UN organisation located outside Europe or North America. The Environment Fund, raised by voluntary contributions from national governments, in distinction from the UN budget itself, has a target of $100 million for the period of 1973-1977. In broad terms, the purpose of the Fund is to meet special costs for environmental action approved by the Council, beyond services which are, or can be, provided by other agencies in the UN system.

What is the role of NGO's in relation to UNEP? What links are developing between the private professional sectors and the governmental process? NGO's are considered valuable on the international scene, because (a) they can serve as objective observers and critics of governmental environmental disputes, (b) they are likely to have professional and disciplinary bonds with their counterparts in countries with different ideologies, while governments are more rigidly divided by political philosophy, (c) each NGO addresses itself to a problem or group of problems which reach deeply into the life of local communities. 'They . . . reserve their rights as citizen bodies to offer constructive criticism of official programs and to remain alert to new needs and possibilities,' as stated in an NGO document.[4]

In all of their meetings, the non-governmental organisations

expressed their support for UNEP. But this support is not unquestioning, and certainly not uncritical. In its own terrain of expertise, a specialised professional or scientific organisation represents the collective problem-solving and creative power of its members. On the other hand, an organisation's relationship to a government agency will greatly depend on the particular value the organisation represents for the success of the agency's program. As a former staff political scientist of the U.S. National Water Commission said:

> Information is a political tracer element that delineates the channels of communication within a decision-making process. Up to this decade, the channel from environmental interest to decision makers was negligible.[5]

In UNEP's relationship with the environmental private sector, there is actually more unity of purpose and cohesiveness than in many other fields. All basic documents relating to the program express the need for scientific, technical, legal and other expert knowledge. 'Organisations outside the United Nations system, particularly those in the countries and regions concerned, should be utilized in support of programs financed by the Environment Fund.'[6]

What is the relative value of the product, or contribution, the library and information professions can offer to the international environmental program? This product is twofold; (a) *it is environmental information, and* (b) *it is professional knowledge and skill necessary for the improvement of environmental information.*

An analysis of UNEP documents, particularly the *Action plan for the human environment,* finds that information is seen by all elements in the UNEP-NGO co-operative effort as a forceful and potent factor in environmental improvement. In fact, the value of information to the program is implied even if the word itself is not used. Because of diffuse and unstandardized terminology in this field, throughout the document (UNEP/GC/5), terms like 'the collection of research data', 'the exchange', 'transfer of information', 'documentation' and many others imply various aspects of the same professional activity.

Following the line of thought that the role of a professional institution will be largely determined by the contribution it can make to the pool of expertise, and that information, and the various professional activities relating to information, represent a widely needed and frequently stressed contribution, one may conclude that information-handling institutions (including libraries) would play a key role in UNEP's program. In this case a unified, systematic approach to the planning of various information roles should be used in the interest of the whole range of UNEP program needs. Such a unified approach would embrace the role of information not only in the scientific and technical aspects (e.g. pollutants, atmosphere, oceans, energy, etc.) but also in the 'environmental education' specialists. This is a far more complex and far-reaching interpretation of what information

means for the UNEP program than has been brought out so far. It should not be assumed that the International Referral System alone can meet this need.

The International Referral Service

As part of *Earthwatch*, the global monitoring and environment evaluation program of UNEP, the International Referral Service (IRS) for environmental information sources was approved by recommendation 101 of the Stockholm conference. The recommendation emphasized the need for the 'advice of a group of experts'. The IRS is envisioned as a computer-based switchboard mechanism. An information user will receive a list of names, addresses, and descriptions of potential information sources, rather than an answer to his question. Sources of information have been identified by the IRS as 'formal information services, information analysis centers, data files and small groups of individuals with particular expert knowledge'[7]. Other systems providing similar service will be able to 'plug-in'. The innovative factor is, of course, the inclusion in the network of *individual expertise*, a trend which is gaining attention in the information professions. The enormous heterogeneity of the world-wide users will put unusual responsibilities on those who are planning the system.

> Technical assistance and training should be extended to facilitate the use of the service by developing countries. There will also be a need for a general training of both users and those responsible for gathering the data, to ensure that information sources are correctly catalogued and users are able to formulate their questions in such a way as to make the most efficient use of the service.[8]

NGOs at UNEP-related conferences insist that interaction between the IRS and the non-governmental sector must be truly two-way. It would be inconceivable that the IRS could depend on the information resources and services of organisations which, at the same time, would not be eligible to use the IRS themselves. Steps toward the establishment of national focal points for the IRS network have been undertaken by several countries. These national focal points, in co-operation with other institutions, will have to keep the interests of government agencies and those of the private sector in balance.

Ideological aspects of environmental education and information

The IRS is only a first step. Viewed in its totality and carefully interpreted, UNEP's action plan will require the rethinking of some concepts, and the development of new approaches to information handling. Even while we are debating the merits and drawbacks of some trends, the international scientific and professional community, mobilized for co-ordinated environment planning and management, has already set a whole mechanism of information activities into motion.

The UNEP *Action Plan* (UNEP/GC/5) classifies these activities into three broad categories.[9]

ENVIRONMENTAL ASSESSMENT	**ENVIRONMENTAL MANAGEMENT**
EVALUATION AND REVIEW Identification of what knowledge is needed. RESEARCH To create new knowledge. MONITORING To gather data and to evaluate data. INFORMATION EXCHANGE To disseminate knowledge.	PLANNING CONSERVATION DEVELOPMENT
SUPPORTING MEASURES	
EDUCATION at all stages and training of specialists, multi-disciplinary professionals and technical personnel. PUBLIC INFORMATION to facilitate the utilization of knowledge in decision-making at every level. ORGANISATION activities. FINANCING. TECHNICAL co-operation.	

What is peculiar about this scheme is that 'information exchange' is classed under *assessment*, but 'public information to facilitate the utilization of knowledge' is seen as a *supporting measure*. However, in the information transfer process, (a) the gathering and evaluation of data, (b) the dissemination of specialized knowledge derived from data, and (c) the repackaging of specialized knowledge into layman's terms for the public, are three phases in the *same* chain. The crucial point is that the same data may be interpreted, packaged and presented differently, for different clienteles, depending on the information context (institutional, industrial, governmental, academic, public, etc.). Consequently, *information professionals are needed who understand the social implications of the information flow*, and who can draw on and interact with information sources in information environments other than their own.

One of the particular objectives of UNEP is to 'help governments increase public awareness through better education and knowledge of environmental concerns and facilitate wide participation in and support for environmental action'.[10]

This takes us directly into the critical area of mass information, variously translated as 'enlightenment' and 'propaganda'. The interpretation of educating the public, indeed may vary from country to country, from cultural area to cultural area, depending on the ideologic emphasis or stigma attached to the concept of

influencing the public mind, that is, changing people's thinking, attitudes, value systems and life styles. Maurice Strong alluded to this conflict in addressing an NGO conference, when he said that large segments of the UN constituency object to the idea of influencing the public. The UNEP document's carefully chosen expression, 'public awareness' (rather than 'love of mankind' or 'love of nature' or any other expression with ethical connotation) was meant to avoid just this controversial point.

In the United States, an official source states:

> Through environmental education, we can learn how to explore the implications of our activities and the choices we have, and can establish a pattern of feedback to help us constantly reassess our activities. This would be the process of 'continuous social diagnosis' that was emphasized . . . in Stockholm.[11]

On the other side of this dichotomy of approach stands the declaration of the Non-Governmental Organisations at Stockholm (signed by NGO observers in their individual capacities), which pronounced unhesitatingly that:

> The essentially interdisciplinary, humanistic and ethical aspects of environmental education — the science of ecology, planetary loyalty, respect for life, care for others and a lack of all rapacity — should be stressed at every level of education and mass communication so that all people develop a primary love for their fellow human beings and for their native planet.[12]

To find a compromise in this philosophical-political divergence of opinions, the UNEP action plan insists that 'By reason of cultural and political differences, the processes of information and education should be mainly the responsibility of national bodies'.[13] In this context, information may be interpreted as public enlightenment rather than the provision of research data.

What lies ahead in international co-operation?

From the vantage point of information services, at least four broad organisational avenues are developing, along which professional associations and other NGOs may interact with each other and UNEP.

1. *Direct interaction with UNEP, and its various components.*
The acquisition and careful study of documents relating to UNEP and the IRS would enable an organisation or institution to ascertain where and in what way it could support the program professionally.

2. *Co-operation within the new structure.*
At the Nairobi conference in 1974, the International NGO Center was created to keep communications between UNEP and NGOs open. In addition, there are NGO working groups in such fields as: natural resources and co-systems; population, health, and biology; the economic and social aspects of development

and environment; information and education; human settlements; institutional problems of NGOs of less developed countries; energy, economy and commerce; inter-disciplinary aspects of environmental problems; law of the sea. These groups will have the task of mobilizing the expertise available in the NGO community and of assisting in the formulation of policy and the identification of issues. Their task will also be to take part in a world movement of information and education.

3. *Action through existing professional groups.*
Examples of this action are seen through the international conferences in key problem areas which have mobilized the best professional resources of member countries: the Conference on the Law of the Sea, the Population Conference, the Conference on Environmental Medicine and Biology. The Conference-Exposition on Human Settlements to be held in Vancouver, Canada, 1976, will have NGO support and contributions.

4. *Interaction through existing international information projects and groups.*
For instance through UNISIST, FID, ISO, International Centre of the International Serials Data System, Abstracting Board of the International Council of Scientific Unions, etc.

In order to maintain a unifying perspective, a whole range of informational and educational support roles for environmental activities should be developed in addition to the IRS.

These support roles of the information professions, using both formal and informal avenues and methods, can be developed in:

(a) *Environmental education:*
Formal: academic, special, institute and association libraries and information centres.
Informal: public libraries, civic centres, citizens' referral centres, information offices of community agencies, museums, cultural organisations.
(b) *Environment research, planning and management:*

Through all types of information centres and data banks which support users in any of the following categories:

(i) Users of specialised, research, and scientific and technical data,
(ii) Users of management information,
(iii) Legislators, regulatory agencies, etc.

(c) *Education and training of environmental information specialists:*
Formal: Graduate schools of librarianship and information science.
Informal: Regional meetings, workshops, seminars, etc.

More emphasis is needed on the *co-operation of information specialists at the community level.* Many of the environmental issues will be decided in local communities, with varying degrees of citizen participation. National networks will have to depend

on community input for comprehensiveness. It is essential that professionals find new ways of interaction (e.g. human networks community information centres, referral services, etc.).

The multi-disciplinary, multi-jurisdictional and multi-institutional nature of environmental information calls for *intensive education and training programs for information specialists* around the world. Local social and economic conditions must be carefully considered. Innovative ways of information handling (e.g., information counselling, filtering, repackaging, etc.) should be developed not only on the basis of new technologies, but on the basis of societal and individual attitudes in information seeking.

NOTES AND REFERENCES

1. HENDERSON, Hazel. Information and the new movements for citizen participation in *American Academy of Political and Social Science Annals*. 412, March 1971: p34
2. MEAD, Margaret. Presentation . . . World Society of Ekistics. *International Associations*. 25, Aug/Sept 1973: p408
3. United Nations Environment Programme. Information Service. Press Release, June 1, 1973. (UNEP/3).
4. World Assembly of Non-Governmental Organisations Concerned with the Global Environment. Draft statement of the NGO's Assembly to the Governing Council of the United Nations Environment Programme. June 17, 1973.
5. INGRAM, H. M. Information channels and environmental decision making. *Natural Resources Journal*. 13, January 1973: p150
6. United Nations. General Assembly. Resolution 2997 (XXVII), Part III, para. 3.
7. United Nations Environment Programme. *Action plan for the human environment* . . . Note by the Executive Director on the Demonstration Project Concerning the International Referral Service, June 12, 1973. (UNEP/GC/L6). p1
8. *op. cit.* United Nations Environment Programme. *Action Plan* . . . p20
9. *op. cit.* United Nations Environment Programme. *Action Plan*. p3-4
10. *op. cit.* United Nations Environment Programme. *Action Plan* . . . p8
11. U.S. Office of Education. *Environmental education handbook*. Washington, D.C., 1972. p9
12. Declaration of the Non-Governmental Organisations in *Environment Stockholm*, United Nations, Centre for Economic and Social Information, Geneva, 1972. p17 (Tabloid)
13. *op. cit.* United Nations Environment Programme. *Action Plan* . . . p34

SECTION F

FURTHER READING LIST:

Anglemyer, Mary and S. R. Ottersen. Beyond Stockholm. *Spec. Lib.* 63:407-410, Sept 1972.

Australia. Scientific and Technological Information Services Enquiry Committee. *The STISEC report: report to the Council of the National Library of Australia, May 1973.* Canberra, National Library of Australia, 1973.

Bonn, G. S. ed. *Information sources in the environmental sciences.* Champaign-Urbana, Ill. Univ. of Illinois Press, 1973. 18th Allerton Park Institute Papers.

Burton, Hilary D. Personal information systems: implication for libraries. *Spec. Lib.* 64:7-11, Jan 1973.

Crane, Diana. *Invisible colleges: diffusion of knowledge in scientific communities.* Chicago, Univ. of Chicago Press, 1972.

De Vore, Helen L. Acquisition policy. *Spec. Lib.* 61:381-4, Sept 1970.

Dosa, Marta K. A view of the international environmental information problem. *Spec. Lib.* 64:457-63, Oct 1973.

Dosa, Marta L. An integrating approach to environmental information. *Spec. Lib.* 65:189-193, April 1974.

Garrow, C., J. H. Gilmore & G. L. Jackson. SDI in CSIRO. *Aust. Lib. Jnl.* 23(4):131-136, 1974.

Groenewegen, H. W. The Stisec report: a review article. *Aust. Lib. Jnl.* 22(7):262-265, 1973.

Harvey, Nigel. Sources of information on environmental pollution. *Aslib. Proc.* 25(8):300-319, 1973.

Ingram, Helen M. Information channels and environmental decision making. *Natural Resources Journal.* 13:150-169, Jan 1973.

La Trobe University Library Staff paper. Academic libraries and interdisciplinary studies — problems without solution. *Vestes.* 17(2):139-144, Aug 1974.

Ladendorf, Janice. Information service evaluation: the gap between the ideal and the possible. *Spec. Lib.* 64:273-279, July 1973.

Lamberton, D. M. National information policy. *Amer. Acad. Pol. Soc. Sc. Ann.* March 1974.

Lamberton, D. M. The necessity for a national information policy. *Aust. Lib. Jnl.* 23(6):211-216, 1974.

Maguire, Carmel. Is a science of information possible? *Vestes.* 17(2):144-151, Aug 1974.

Maier, Joan M. The scientist versus machine search services. *Spec. Lib.* 65:180-8, April 1974.

Middleton, M. INIS: the International Nuclear Information System. *Aust. Lib. Jnl.* 23(5):136-140, 1974.

Morris, D. S. ed. *Information technology: initiatives for today — decisions that cannot wait.* Part II of a study on information technology: some critical implications for decision makers 1971-1990. New York, The Conference Board, 1972.

Murdock, Lindsay and O. Opeibo. Computer literature searches in the physical sciences. *Spec. Lib.* 64:442-5, Oct 1973.

NATO/AGARD. *How to obtain information in different fields of science and technology: a users' guide.* Paris, NATO, 1974.

Organization for Economic Co-operation and Development. *Information for a changing society: some policy considerations.* Paris, OECD, 1971.

Plate, Kenneth H. Library classification for environmental science. *Jnl. of the Water Pollution Control Federation.* 38:586-4, April 1966.

Swan, Elizabeth. A national technical information system? *Search.* 5(5):180-181, May 1974.

UNESCO. *UNISIST study report on the feasibility of a world science information system.* Paris, Unesco, 1971.

United Nations Environment Programme. *Action plan for the human environment.* 1973. (UNEP/GC/L.6).

United Nations Environment Programme. *Introduction to the International Referral System: earthwatch, November 1973.* (EW/IRS/INF 1).

U.S. Environmental Protection Agency. National Environmental Research Center. *National environmental information symposium: summary report. volume 1.* Cincinnati, Ohio, NERC, May 1973.

U.S. Panel on Science and Technology. *The management of information and knowledge: a compilation of papers prepared for the eleventh meeting of the panel on science and technology.* Washington, McGrath Publ., 1970.

Vagianos, Louis. Education for scientific and technical information work. *Journal of Education for Librarianship.* 14(2):83-95, 1973.

SECTION G.

SELECTED SOURCES OF ENVIRONMENTAL INFORMATION ▷

Much information stored in personal files and memories never finds its way into publication: this kind of information is very often shared only with immediate colleagues and does not reach many people who could benefit from it. It was clearly seen during the last day of the Workshop that participants had a wealth of information to exchange and share. This list is a direct outcome of this session in which members reported on their field experiences, methods, techniques and materials used in information collation. The choice of items is therefore selective: brief annotations and addresses of publishers have been included when possible. The material is divided into Australian and International sections in five of the categories given: international periodical titles are omitted as they are adequately covered elsewhere. This list is seen as a contribution towards a more comprehensive bibliography of Australian sources of environmental information.

1. ABSTRACTS, INDEXES AND INFORMATION SERVICES

Australian

Australian science index. CSIRO, Melbourne.

Indexes articles published in Australian scientific and technical serials; author and subject indexes.

CSIRO abstracts. CSIRO, Melbourne.

Includes material from data bases searched by CSIRO which include CA Condensates and Food Science and Technology Abstracts.

Environmental topics current awareness bulletin. Centre for Environmental Studies, University of Melbourne, Parkville, Victoria, 3052.

Indicates articles, books and conferences of interest to the field of environmental research. Gives brief annotations and location of periodicals in University of Melbourne libraries. Irregular issues.

Technical LISARD: Library and information service automated retrieval of data.
ACI Technical Centre Pty., Ltd., Melbourne.

An SDI publication for ACI and associated industries; includes articles and abstracts in environmental control including solid waste management and recycling. Weekly or fortnightly issue.

Water resources technical information services. Australian Water Resources Council, Canberra, 1973. Series: Hydrological series No 7.

Considers aspects of the dissemination and exchange of information in the water resources area in Australia.

Victorian National Parks Association index to Newsletter, No 1, July, 1973 to No 93, July, 1973; compiled by Sandra Bardwell. VNPA, Melbourne, March, 1974.

International

Abstracts on health effects of environmental pollutants. Biosciences Information Service, (BIOSIS), 210 Arch Street, Philadelphia, Penn., 19103, USA. Monthly.

Air quality abstracts. Published by Pollution Abstracts Inc., PO Box 2369, La Jolla, Ca. 92037, USA.
Air pollution abstracts. Environmental Protection Agency, Washington, D.C., USA.
Prepared by Air Pollution Technical Information Centre (APTIC), Research Triangle Park, North Carolina, 27711, USA.

Air quality digest. University Digest Service, PO Box 343, Troy, Mich. 48084, USA.
Bimonthly.

Bioresearch today: pesticides. Biosciences Information Services (BIOSIS), 210 Arch Street, Philadelphia, Penn. 19103, USA. Monthly.

Bundesanstalt für Vegetationskunde, Naturschutz und Landeschaftspflege. Analyse der referateorgane und anderer sekundarquellen über Umweltschutz. Survey of abstracting and other secondary services in environmental science. Bad Godesberg, Germany. 1972.

Summary in English.

Ecolert. Montreal, Orba Information Ltd., 418 Saint Aulpice Street,

Montreal 125, Quebec, Canada.

A weekly abstracting publication which features current international news releases in environmental fields; includes abstracts from periodicals and newspapers.

Eko Indok. Bulletin of the referral center of the University of Zagreb, Indoc-Center for Protection and Improvement of Human Environment, PO Box 327, Trg. Marsala Tita 3, 41001 Zagreb, Yugoslavia.

Information on institutes and organisations in the field of protection and improvement of human environment.

Energy: weekly government abstracts. National Technical Information Service, 5285 Port Royal Road, Springfield, Va. 22161, USA.

Energy index: a select guide to energy information since 1970. Annual index published by Environment Information Center, Inc., 124 East 39th Street, New York, N.Y., 10016, USA.

Environmental abstracts. Published monthly by Environment Information Center Inc., Publications Division, 124 East 39th Street, New York, N.Y., 10016, USA.

Formerly titled *Environment information access.*

Environmental awareness reading list. Published semi-monthly by National Technical Information Service, 5285 Port Royal Road, Springfield, Va. 22161, USA.

Environmental health and pollution control. Published monthly by Excerpta Medica, PO Box 1126, Amsterdam, Netherlands.

Environmental periodicals bibliography. International Academy, Environmental Studies Institute, Santa Barbara, California, USA.

Six issues a year with annual index. Tables of contents of 260 U.S. and foreign periodicals on environmental and related studies.

Environmental pollution and control: weekly government abstracts. National Technical Information Service, 5285 Port Royal Road, Springfield, Va. 22161, USA.

Environmental quality abstracts. Published quarterly by Data Courier Inc., Louisville, Kentucky, USA.

Index of selected outdoor recreation literature. v 1, 1967. U.S. Dept. of the Interior, Bureau of Outdoor Recreation, Washington, D.C., USA.

Abstracts of periodicals and other materials received by the Dept. of the Interior Library. Subject, name and geographic indexes.

Industrial wastes information bulletin. Published monthly by Information Office, Hazardous Materials Service, Building 151, Harwell Laboratory, Oxfordshire, England.

Index to IUCN publications new series. Nos 1-10, 1968. International Union for Conservation of Nature and Natural Resources, Morges, Switzerland.

Natural resources: weekly government abstracts. National Technical Information Service, 5285 Port Royal Road, Springfield, Va. 22161, USA.

Pesticides abstracts. Published monthly by Environment Protection Agency, Washington, D.C., 20460, USA.

Pollution abstracts. Six issues a year, published by Pollution Abstracts Inc., PO Box 2369, La Jolla, California, 92037, USA.

Summarises and indexes the world's technical literature on the environment.

Pollution lookout. Published by Karolinska Institute, Biomedical Centre, Stockholm, Sweden.

Contains references to articles dealing with pollution being indexed in Biological Abstracts, Bioresearch Index, Chemical Abstracts and Medlars.

Pollution research index. PO Box 74, Guernsey, British Isles.

A reference book of organisations, universities and institutes concerned with research in the fight against pollution.

Selected water resources abstracts. Published bi-monthly by Water Resources Scientific Information Center, U.S. Department of the Interior. Available from NTIS, 5285 Port Royal Road, Springfield, Va., 22161. USA.

Solid waste management: abstracts and excerpts from the literature. Washington, D.C., US Bureau of Solid Waste Management, 1970.

Summaries of foreign government environmental reports. Published monthly by Environment Protection Agency, Washington, D.C., 20460, USA.

Underwater information bulletin. Six issues a year. IPC Science and Technology Press Ltd., 32 High Street, Guildford, Surrey, England.

Includes sections on pollution, policy and legislation.

Water quality abstracts. Published by Pollution Abstracts Inc., PO Box 2369, La Jolla, Ca. 92037, USA.
Water quality digest. Published bi-monthly by University Digest Service, PO Box 343, Troy, Mich. 48084, USA.

2. BIBLIOGRAPHIES

Australian

Bibliography of Australian fisheries. Canberra, Department of Primary Industry, Fisheries Division, 1971. Series: Australian fisheries paper no 12.

907 items listed in subjects; author and title entries; author index; no annotations.

Bibliography of information relating to the South-Western Australian estuarine environment, by R. C. Lenanton. Perth, Department of Fisheries and Fauna, Western Australia, 1972. Series: Fisheries bulletin no 11.

Contains 102 items.

Bibliography of Murray Valley hydrology, 1964-1967, by Jane Sharpe. Melbourne, CSIRO, 1969.

1399 items arranged in broad subject groupings.

Bibliography of soil surveys and compiled soil mass in Victoria. Prepared by Victorian Soil Survey Committee, 1953. Plus supplement prepared January, 1961. Melbourne.

A reference list of all Victorian Soil Survey data up to January, 1961.

Bibliography of tourism and recreation research. Melbourne, Australian Tourist Commission, 1973.

Items annotated and presented in subject areas by author and title; geographical and author indexes.

Bibliography of urban studies in Australia. Canberra, Australian Institute of Urban Studies, 1971-73.

Volume I: 1966-1968; Volume II: 1969-71; Volume III: 1972; Volume IV: 1973.

The bibliography contains subject and locality indexes and a list of periodicals cited. Annotations included.

Books and films on the environment. Committee for the Understanding of the Environment. Perth, 1973.

Conservation: selected bibliography. Series: ACF occasional publication no 6, 1971. East Melbourne, Australian Conservation Foundation.

Ecology of Australia's flora and fauna with special emphasis on conservation, by Jennifer Fernando, Melbourne, RMIT, 1974.

A bibliography of 66 items of material held in the Monash University Library system. Typescript.

Economics of pollution: bibliography, by I. Bowen, Melbourne, RMIT, 1970.

82 items. Mimeographed.

Select bibliography of literature suitable for students' environmental studies, Environment Information Centre, Adelaide. 1974.

Draft copy.

A select bibliography on the environment with special emphasis on technological and economic aspects, by Geoff Lacey. February, 1974. Available from PO Box 40, Kingsford, NSW, 2032.

193 items listed under subject headings; includes books and journal articles; no annotations or indexes.

A survey of the literature concerning the forests of Australia: prepared for the Council of the Municipality of Ku-ring-gai, edited by Valerie H. Boughton. 1970.

A bibliographic essay, followed by a bibliography containing 152 items of Australian material and 14 items of overseas material.

Water pollution control in the food industry: a select bibliography, by Gail Morrison. Melbourne, RMIT, 1974.

Typescript.

International

Agricultural utilization of sewage effluent and sludge: an annotated bibliography, by James P. Law. Washington, D.C., US Federal Water Pollution Control Administration, 1968.

Air pollution aspects of emission sources: municipal incineration. Washington, D.C., Environment Protection Agency, 1971.

A bibliography of 320 items with abstracts.

Documents on international organisations; a bibliographical handbook, edited by Theodore Dimitri. London, International University Publications/American Library Association, 1972.

Energy conservation: selected basic documents and related materials: an annotated list. Orlando, Fla., Florida Technological University, 1974. 14 p.

Bibliography of Canadian reports on solid waste management. Ottawa, Environment Canada, Solid Waste Management Division, 1973.

235 items; no annotations.

The climate of cities: a survey of recent literature, by James T. Peterson. Durham, N.C., National Air Pollution Control Administration, 1969.

Council of Europe documents about the environment. European Information Centre for Nature Conservation. Strasbourg, 1971.

Environment: annotated bibliography. Natural resources and the human environment; FAO publications and documents, 1967-1970.

Rome, Food and Agricultural Organisation, 1971.

Environmental information resources: a selected annotated bibliography 1970-1974, by Frances K. Wood. Presented at Reference Update 1974, a continuing education seminar, Special Libraries Association, Toronto, Canada, June 9-13, 1974. Madison, Wisconsin, Engineering Library, University of Wisconsin, 1974.

Organised into five parts: encyclopedias, handbooks, atlases, dictionaries; indexes and abstracts; bibliographies, lists; directories, guides; and newsletters, current affairs reports. Largest single section is 'Directories, Guides' with 20 titles. There are 59 entries altogether.

Environmental information sources. Engineering and industrial application: a selected annotated bibliography, by Carole Schildhaur. Special Libraries Association, 235 Park Avenue South, New York, N.Y. 10003. 45 p.

Environmental periodicals for public libraries: a selected annotated list, by Ann H. Raup. Western Michigan University, School of Librarianship, Kalamazoo, Mich., 1973.

Environmental planning: a selected annotated bibliography, by Michael Meshenberg. Chicago, American Society of Planning Officials, December 1970

Environmental pollution: a select bibliography with annotations. London, Department of the Environment, July 1971.

Brief annotations of 118 items; no 149 of the bibliography series of the Main Library of the Department of the Environment.

Environmental services: bibliography, compiled by Bernadine E. Hoduski. Kansas City, Environment Protection Agency, 1973.

Freshwater pollution: bibliography. London, Department of the Environment, March 1972.

203 items briefly annotated; no 148J of the bibliography series of the Main Library of the Department of the Environment.

The human environment. Two volumes. Washington, D.C., Woodrow Wilson International Center for Scholars, March, 1972.

Volume one: a selected, annotated bibliography of reports and documents on international environmental problems.

Volume two: summaries of national reports, submitted in preparation for the United Nations Conference on the Human Environment.

International environmental policy: an annotated bibliography, by John Dinsmore. Green Bay, Wisc., Wisconsin University, 1972.

International organisations: an interdisciplinary bibliography, edited by Michael Haas. Stanford, California, Stanford University, Hoover Institution Press, 1971.

Lake and river pollution: an annotated bibliography, by Evelyn Sinha. Ocean Engineering Information Series, Report, Vol. 4, 1971.

Over 600 abstracts of literature containing substantial scientific and technical information on lake and river pollution.

Man and the environment: a bibliography of selected publications of the United Nations system 1946-1971, compiled by Harry N. W. Winton, New York, Unipub, 1972. 305p.

Marine and coastal pollution, by Kathleen Connolly, London, Department of the Environment, 1973.

Brief annotations of 181 items; no 148c of the bibliography series of the Headquarters Library of the Department of the Environment, London.

Marine pollution research titles. Marine Biological Association of the United Kingdom. Marine Pollution Information Centre. Plymouth, 1974.

No annotations.

Mercury: a bibliography of publications dealing with mercury in the environment and its related toxicological action, by Claude Jardin. Rome, Joint FAO/WHO Food Standards Program, 1971.

Contains 2800 references.

Mercury contamination in the natural environment: a bibliography. Washington, United States Department of the Interior, 1970. 32p.
Planning for environmental quality: a bibliography, by George H. Hagevik. Monticello, Ill., Council of Planning Librarians, Exchange Bibliography no 97, 1969.

Pollution: a selected bibliography of United States government publications on air, water and land pollution, edited by Louis Kiraldi and Janet L. Burk. 2nd ed. Kalamazoo, Michigan, Institute of Public Affairs, Western Michigan University, 1974.

Pollution: sources of information, edited by Kay Henderson. London, Library Association, 1972.

Proceedings of a one day conference held by the Library Association in October, 1971.

Preliminary bibliography for national parks and reserves, by Diana Kelly. Botany Division, DSIR and New Zealand Department of Lands and Survey, 1970.

Approximately 3,500 items.

Selected federal computer-based information systems, edited by Saul Herner and Matthew J. Vellucci. Washington, Information Resources Press, 1974.

Ground water pollution: a bibliography, by W. K. Summers and Zane Spiegel. Ann Arbor, Michigan, Ann Arbor Science Publishers, 1974. 83 p.

400 entries, partially annotated. Some of the areas covered are: contamination by nitrates, heavy metals, pesticides, herbicides, the effects of solid waste disposal, urbanisation, animal wastes and petroleum products. Not indexed.

A survey of indexing and abstracting services for water resources engineers. Water Resources Research Centre Technical Report, no 11. College Park, University of Maryland School of Library and Information Service, n.d.

United Nations Conference on the Human Environment, Stockholm, Sweden, June 5-16, 1972. *A guide to the conference bibliography*. New York, Unipub Inc, n.d.

Zaklad Ochrony Przyrody, Polskiej Akademii Nauk. *Bibliografia ochrony przyrody w Polsie za lata 1965-1966. Bibliography of the protection of nature in Poland covering the period 1965-1966*. Krakow, 1969.

1695 items.

3. CONFERENCES, SYMPOSIA, WORKSHOPS

Australian

1964-1969

Australian Institute of Parks and Recreation. Conference report of 41st Annual Conference, Perth, Western Australia, 29th September to 4th October, 1968.

Clean Air Society of Australia and New Zealand. Clean air conference 1969, 19th to 22nd May, 1969.

Pre-printed papers.

Natural Resources Conservation League of Victoria. West Gippsland Regional Committee. National resources convention held at Leongatha, Vic., October 17, 1968.

National Trust of Australia (NSW). The bushfire problem in public lands; the proceedings of a seminar conducted at Leura, NSW, on 16th and 17th April, 1966.

National Trust of Australia (NSW). The preservation of bushland in the Sydney region; the proceedings of a seminar conducted at Macquarie University on 27th and 28th July, 1968.

Sporting Shooters Association of Australia (Victoria). Game Research and Management Committee. Conservation symposium (game management) held at Monash University, May 31st, 1969. Tasmanian Conservation Trust. Symposium on pollution, 15th November, 1969.

Town and Country Planning Association of Victoria. Conservation and development — who said you can't have both? Report of proceedings of a seminar, Camberwell, Vic., October 11, 1969.
Organised by the Association in association with a number of other bodies.

University of Adelaide, Department of Adult Education. Proceedings of Wildlife Conservation School and Seminar, August 12-16, 1966.

University of New England, Department of University Extension. National parks: report on the proceedings of the National Parks School held at the University, February 14-16, 1964.

University of New England, Department of University Extension. Papers presented at the National Parks Seminar held in Lismore, November 30, 1968.

Wimmera Regional Committee. Need for reservations in desert settlement; record of proceedings of a conference, Nhill, Vic., August 26, 1964.

1970-1974

Australia. Department of Tourism and Recreation. Leisure; a new perspective. A national seminar, April 22-24, 1974, Canberra, A.C.T.

Australian and New Zealand Association for the Advancement of Science, New South Wales Division. Noise pollution; symposium, Sydney, February 25-26, 1971.

Australian Atomic Energy Commission. Symposium on the role of nuclear energy in Australia's development, Canberra, June 1-2, 1972.

Australian Conservation Foundation. Conservation and mining: papers of an Australian Conservation Foundation symposium held at the University of Sydney, February 20, 1971. Series: ACF Special Publication no 8, 1972.

Australian Forestry Council for Wood. Eight reports submitted for the consideration of the Forestry and Wood-based Industries Development Conference, Canberra, April, 1974.

Australian Institute of Agricultural Science, ACT Branch. People and production; the rural scene in 1990. Proceedings of a symposium held at Canberra, October 5, 1972.

Australian Institute of Mining and Metallurgy. Progress: mining and environment. Reprint of papers at 1971 National Seminar, April 19-21, 1971.

Seminar sponsored by the Institute and the Australian Mining Industry Council.

Australian Institute of Parks and Recreation. Conference report on the 45th Annual Conference, Broadbend, Queensland, October 1-6, 1972.

Australian Institute of Urban Studies, Victorian Division. Urban development in Melbourne; seminar held in Melbourne on June 14, 1974. AIUS Publication no 44.

Australian Waste Management and Control Conference, University of New South Wales, Department of Fuel Technology, July 17-19, 1974. The conference papers edited by N. Y. Knorr, Sydney, 1974.

Clean Air Society of Australia and New Zealand. Proceedings of the 1972 International Clean Air Conference, Melbourne, May 15-18, 1972.

Conservation Society of New South Wales. Symposium on 'Crisis — Pollution 1970', sponsored by the Society with the National Conservation Council of N.S.W. and the Sydney University Conservation Society, held at University of Sydney, August 1, 1970.

Douglas, Neil. The residential conservation zone; a report on a management concept for privately owned bush within the influence of metropolitan Melbourne; by Neil Douglas (and others).

Draft report prepared for consideration at a symposium held at ACF headquarters on August 7, 1974.

Forests Commission of Victoria. Eucalypt Crown Dieback seminar, Lakes Entrance, November 12-16, 1973.

Draft copy of proceedings.

Forum on Roadsides and Conservation, held Burnley Horticultural College, November 16, 1974. [Papers]. roneo.

Arranged by Victorian National Parks Association, Natural Resources Conservation League, Town and Country Planning Association and Conservation Council of Victoria.

Hydrological Society of South Australia. Water in the home; proceedings of a symposium arranged jointly by the Society and the Department of Adult Education, University of Adelaide, held in Adelaide, November 9-10, 1973.

Institute of Foresters of Australia. Seventh triennial conference, Caloundra, Queensland, September 2-6, 1974. Working papers: Volume 1, 1974.

Institution of Engineers Australia. Perth polluted or Perth pleasant; a symposium, Perth, September 1 and 2, 1972.
[Preprints].

National Conservation Study Conference, Canberra, 1973. Proceedings of the first National Conservation Study Conference, organised by voluntary conservation groups in association with the Australian Conservation Foundation. Melbourne, Australian Conservation Foundation, 1973.

National Packaging Association of Australia. Packaging and the environmental countdown; seminar held in Melbourne, September, 1971.

National Parks Association of Queensland. National parks and man; symposium, July 25-26, 1970 at Cunningham's Gap National Park, Qld.

Natural Resources Conservation League of Victoria. Land use forum; discussion papers of forum held March 23, 29 and 30, 1974.

Port Phillip Bay Environmental Seminar. Summaries of papers given at the seminar held at Monash University on September 8, 1973.

Public Relations Institute of Australia, (NSW). The PR practitioner in environmental issues; papers delivered to a seminar, Sydney, June 24, 1972.

Recreation Conference held at Monash University, Clayton, May, 1974. Sponsored by Victorian Department of Youth, Sport and Recreation.
Papers [1974]

Royal Australian Institute of Architects. The consequences of today; a record of papers given at the Centenary Convention, May 22-28, 1971.
Supplement to *Architecture in Australia*, August 1971.

Tropical Grassland Society of Australia. The major lands of Australia; symposium held at Charleville, Queensland, August 22-24, 1972.
Proceedings and summary of final session form basis of the issue of *Tropical Grasslands*, V 7, No 1, March, 1973

University of New England, Department of University Extension. Land use planning in the Clarence region; notes on discussion and background papers of a symposium held at Grafton, June 5-6, 1972.

University of New South Wales, Department of Fuel Technology. The 1971 Australian waste disposal conference, February 17-19, 1971.

Preprinted papers prepared for the conference

Victorian National Parks Service. Cinnamon fungus *(Phytothera cinnamoni);* a record of a seminar November 9, 1972.

Includes bibliography.

Water Research Foundation. Water pollution and public welfare, 1970 symposium.

Younger United Nations Association. The quality of life; papers delivered at a conference, Sherbrooke, November 28-29, 1970.

Organised by YUNA and CNIS

International

Friends of the Earth. The Stockholm conference; only one earth, an introduction to the politics of survival. London, Earth Island, 1972.

International Union for Conservation of Nature and Natural Resources. Proceedings of the 11th General Assembly, Banff, Alberta, Canada, September 11-16, 1972.

National Environmental Information Symposium, September 24-27, 1972. An agenda for progress. Volume 1: summary report. Cincinnati, Ohio, National Environmental Research Center, May 1973.

Pollution: sources of information, edited by Kay Henderson. Proceedings of a one day conference held at the Library Association, London, October 27, 1971. London Library Association Reference Special and Information Section, 1972. 102 p.

World Conference on National Parks, Second, 1972. Proceedings, edited by Sir Hugh Elliott.

Published for the National Parks Centennial Commission by International Union for Conservation of Nature and Natural Resources, Morges, Switzerland.

World Energy Conference. General program, ninth World Energy Conference, held at Detroit, September 23-27, 1974. New York, US National Committee of the World Energy Conference, 1974.

United Nations Conference on the Human Environment. Summary report of Australian delegation to the conference, Stockholm, June 5-16, 1972.

Ward, Barbara and Dubos, Rene. Only one earth; an unofficial report commissioned by the Secretary General of the United Nations Conference on the Human Environment, Stockholm, June 5-16, 1972. London, Andre Deutsch, 1972.

4. DIRECTORIES, HANDBOOKS, YEARBOOKS, GLOSSARIES, ETC

Australian

Australia. Department of Environment and Conservation. *Responsibilities and functions.* Canberra, January, 1974. Roneo.

Australia. Department of Tourism and Recreation. *Review of activities to June 30, 1974.* Canberra, 1974.

Conservation directory, 1974. East Melbourne, Australian Conservation Foundation, 1974.

An earlier edition was published in 1970.

Australian government directory, 1974. Canberra, AGPS, 1974.

Australian museums directory. Canberra, Australian National Committee for the International Council of Museums, 1972.

Material in directory given ordered by state, city and title. No title index. 112 entries, including one for Papua New Guinea.

Australian Recreation Research Association. *Membership list, June, 1974.*

Australian Recreation Research Association. *Research register, 1974.*

Australian scientific societies and professional associations. East Melbourne, CSIRO, 1971.

Australian Water Resources Council. *A compilation of Australian water quality criteria* by Barry T. Hart. Canberra, AGPS, 1974. Series: AWRC technical paper No 7.

Includes a glossary of terms and a comprehensive reference list.

Australian Water Resources Council. *Inventory of water resources research in Australia, 1972.* Canberra, AGPS, 1973.

This is the fourth edition; the inventory was first published in 1965. Contains details of 488 research projects and has a subject index.

CSIRO activities and the quality of the environment. 1972.

Summary of current research activities in CSIRO identified as being relevant to the environment and environmental quality.

CSIRO and the environment. 1973. Four page handout describing briefly ways in which some 25 divisions and groups of the organisation are concerned with relevant studies.

Directory of map collections in Australia, compiled and edited by N. M. Rauchle and P. A. G. Alonso. First edition 1974. Melbourne, State Library of Victoria, 1974. 20 p.

Directory of philanthropic trusts in Australia, by E. K. Hart and revised by C. A. Brown. Hawthorn, Victoria, Australian Council for Educational Research, 1974.

Includes an index of trust names, subjects and a list of other directories.

National parks and reserves in Australia, 1968. Canberra, Australian Academy of Science, 1968.

Includes as appendix 6 a map of national parks in Australia.

Nature conservation in Victoria: a survey by Judith Frankenberg; edited by J. S. Turner. Melbourne, Victorian National Parks Association, 1971.

Survey started in 1966 and continued through 1970. Lists national parks and other conservation reserves in Victoria. No index.

Register of historic buildings at December 31, 1973. Melbourne, National Trust of Australia (Victoria), 1973.

Registry of scientific and technical services for the Asian and Pacific region. *Animal industry groups in the Asian and Pacific region.* Canberra, 1972.

Directory of animal industry groups involved in research including a list of research projects.

Registry of scientific and technical services for the Asian and Pacific region. *Computer applications and facilities for science and technology in the Asian and Pacific region.* Canberra, 1973.

Information about computer installations and computer users, including list of each group's relevant publications.

Registry of scientific and technical services for the Asian and Pacific region. *Forestry and forest products groups in the Asian and Pacific region.* 2nd ed. Canberra, 1973.

Information about identifiable administrative units in forestry and forest production including their publications.

Registry of scientific and technical services for the Asian and

Pacific region. *Plant industry, soils and entomology groups in the Asian and Pacific region.* Canberra, 1974.

The directory covers those aspects of agricultural science that are concerned with food and fibre, but not animal industry. Subject and organisational indexes.

Scientific and technical information services in Australia, Royal Australian Chemical Institute. 1971.

Report of a working party appointed by the Council of the Institute. Includes a directory of specialised information services.

Scientific and technical research centres in Australia. East Melbourne, CSIRO, 1969.

International

Advisory Group for Aerospace Research and Development (AGARD). *How to obtain information in different fields of science and technology; a user's guide.* 1974. AGARD lecture series No 69.

A collection of papers, many accompanied by bibliographical or reference lists.

Air Pollution Control Association. *Directory of governmental air pollution agencies, 1972-73.* Pittsburg, Pa., 1972.

Bonn, G. S. *ed. Information resources in the environmental sciences.* Champaign, University of Illinois Graduate School of Library Science, 1973. Series: Allerton Park Institute no 18.

A collection of papers given at the 18th Allerton Park Institute, 1972.

Canadian conservation directory 1973. Ottawa, Canadian Nature Federation, 1973.

Conservation directory. Published annually by the National Wildlife Federation, 1412 16th Street, N. W. Washington, D.C. 20036.

1973 edition edited by Kathleen M. DiBlasio. Lists major national and state public and private organisations concerned with traditional conservation matters; omits organisations concerned with air pollution, energy and several other important fields.

Countryside Commission research register. London, HMSO.

Annual publication.

Directory of consumer protection and environmental agencies, edited by Thaddeus C. Trzyna and the staff of the Center for California Public Affairs, and published in 1973 by Academic Media, 32 Lincoln Avenue, Orange, New Jersey, 07050.

The most detailed directory available. Includes descriptive listings of federal, state and regional governmental agencies, as well as agencies of the fifty largest cities, and numerous national, state, regional and local private organisations.

Directory of data bases in the social and behavioral sciences, edited by Vivian S. Sessions. New York, Science Associates/ International Inc, 1974.

Directory of environmental information sources: second edition, 1972 edited by Charles E. Thibeau. Boston, 1972.

Published by the National Foundation for Environmental Control, Inc., Boston, and distributed by Cahners Books, 89 Franklin Street, Boston, Massachusetts, 02110.

Directory of environmental literature and teaching aids, by Carol Johnson and Jacqui Smith. London, Council for Environmental Education, 1972.

In ready punched loose leaf form, to be kept up to date by issues of further information.

Directory of water pollution research laboratories. Paris, OECD, 1965. 519 p.

Energy directory. New York, Environment Information Center, 1974.

Environment USA; a guide to agencies, people and resources. New York, Bowker, 1974. 451 p.

Environmental networks; state and regional environmental centers and councils in the United States. Center for California Public Affairs, 226 W. Foothill Blvd., Claremont, California 91711, 1973.

Detailed descriptions of 54 centers and councils.

Environmental organisations, by Maria H. Grimes, Washington, Library of Congress, 1972.

Glossary of environmental terms, Swedish — English — French — German. Stockholm, Swedish Centre of Technical Terminology, 1972. 86 p.

Handbook of technical information sources. World Association of Industrial and Technological Research Organisations, (WAITRO).

To be published in 1974.

Handbook on environmental information programs for public libraries, by Martin Cohen. Western Michigan University, School of Librarianship, Kalamazoo, Mich., 1973.

Information sources, by G. F. Bennett. Chemical Engineering desk book issue, June, 1973.

Includes annotated bibliography of periodicals, newsletter, digests, and abstracts concerned with pollution control and the environment .

International compendium of numerical data projects. International Council of Scientific Unions, (ICSU) Committee on Data for Science and Technology, (CODATA), 1969.

Index of human ecology. London. Europa Publications Ltd., 1974.

Cross-disciplinary index to subjects, covering various countries and languages. Specialised information services, indexes and abstracts are included. About 7,000 terms are listed.

Interdok: directory of published proceedings; series PCE; pollution control/ecology. Harrison, New York, Inter-Dok, 1974.

Bibliographic directory of preprints and published proceedings of congress, conferences, symposia, meetings, seminars from 1960 to date.

International environmental guide. Washington, D.C., Bureau of National Affairs, 1974. Loose-leaf.

Texts and/or digest of laws, regulations, treaties and directives from more than 20 countries. There is a special section on bilateral agreements between the United States and other countries and an entire section devoted to Canadian laws and regulations that pertain to the environment. There is also special emphasis on the United Kingdom, Japan, and the United Nations and international organisations. Indexed by country and by subject.

IUCN yearbook, 1972. International Union for Conservation of Nature and Natural Resources. Morges, Switzerland, 1973.

Includes bibliography of publications.

National referral services, worldwide directory. International Federation for Documentation, 1974.

This publication will update an earlier edition entitled: *National technical information services, a worldwide directory,* 3d ed., 1970.

National Wildlife Federation. *Conservation directory, 1972.* Washington, 1972.

The New York Times encyclopedic dictionary of the environment, edited by Paul Sarnoff. New York, Quadrangle, 1971. 352 p.

Ocean research index; a guide to ocean and freshwater research including fisheries research. London, Francis Hodgson, 1970. 505 p.

Sources of information on environmental pollution, compiled by Kathleen Connolly. London, Department of the Environment, 1973. 27 p.

A survey of environmental science organisations in the USA, edited by J. Y. Wang and Raymond R. Balter. San Jose, Ca., Environmental Sciences Institute, 1970.

World directory of environmental education programmes. New York, R. R. Bowker, 1974.

Post-secondary study and training in 70 countries, offered in 740 colleges, universities, technical institutes and international centres are described. Subject, institutional and type-of-program indexes. Prepared by the International Institute for Environmental Affairs and the Institute of International Education.

World directory of environmental organisations, preliminary edition, ed. by Thaddeus C. Trzyna. San Francisco, Ca., Sierra Club. 1973.

World directory of environmental research centers. 2d ed., New York, R. R. Bowker and Oryx Press, 1974.

About 5,000 research organisations in 114 countries are inventorised and arranged by subject and geographical location: includes government agencies, educational institutions, foundations, laboratories, professional, commercial and industrial organisations.

World environmental directory. Silver Spring, Business Publishers Inc., 1974.

Semi-annual publication, starting in June, 1974. Includes governmental agencies, professional services, manufacturers of equipment, education, professional and trade organisations, citizen action groups.

Yearbook of international organisations. 15th ed. Brussels, Union of International Associations, 1974.

Over 4,300 entries. Organisational history, national members, publications and information services are described. Indexes: subject, name (English, French), geographic location, acronyms, keywords (English, French). Bibliography of documents on international relations.

5. LIBRARY CATALOGUES, ACCESSIONS LISTS, ETC.

Australian

Australian Institute of Urban Studies. *List of publications*. October, 1974. Canberra.

Soil Conservation Authority, Victoria. *Publications issued by the Soil Conservation Authority*.

Roneo list.

CSIRO papers, books and patents by members of the staff of CSIRO published during 1972. 1973.

Arranged by CSIRO divisions.

CSIRO serial publications, monographs and pamphlets issued by CSIRO. Melbourne, 1973.

CSIRO technical journals for industry: Australia. Melbourne, 1968.

International

International Institute for Applied Systems Analysis. *Publications list October 1974.* Available from IIASA, Schloss Laxenburg, 2361 Laxenburg, Austria. 13p.

First list of research publications of IIASA; includes conference proceedings, research memoranda, research reports; annotations and abstracts included; fields of research include ecological modules of resource development, world energy consumption, modelling and simulation for environmental impact analysis and environmental accountability.

National Technical Information Service. *Information services, July 1974.* Published semiannually. Available from NTIS, 5285 Port Royal Road, Springfield, Va., 22151.

Natural Resources Information Centre acquisitions list. Quarterly. Toronto, University of Toronto, Faculty of Management Studies, 246 Bloor Street W., Toronto, Ontario, M5S 1V4, Canada.

Nature Conservancy, London. *List of reprints available on request, June, 1973.*

U.S. Environment Protection Agency. Air Pollution Technical Information Center. *Air pollution technical publications of the Environment Protection Agency, 1972.*

Listing only; no annotation.

6. PERIODICALS

Australian

AIPR News
Frequency: irregular
Publisher: Australian Institute of Parks and Recreation, PO Box 18, Northcote, Victoria, 3070.

APPITA
Frequency: bi-monthly
Publisher: Technical Association of the Australian and New Zealand Pulp and Paper Industry, 191 Royal Parade, Parkville, Victoria, 3052.

Aqua
Frequency: quarterly
Publisher: Victorian State Rivers and Water Supply Commission, 590 Orrong Road, Armadale, Victoria, 3143.

Archetype
Frequency: quarterly
Publisher: Royal Melbourne Institute of Technology, School of Architecture and Building, 124 La Trobe Street, Melbourne, Victoria, 3000.

Architecture in Australia
Frequency: six times a year
Publisher: Royal Australian Institute of Architects, 2A Mugga Way, Red Hill, ACT, 2603.

Australian and New Zealand environmental report
Frequency: bi-weekly
Publisher: CCH Australia Ltd., Box 230 North Ryde, NSW, 2113.

Australian bird bander
Frequency: quarterly
Publisher: Bird Banders Association of Australia, PO Box A 313, Sydney South, NSW, 2000.

Australian bird watcher
Frequency: 2 issues per year
Publisher: Bird Observers Club, GPO Box 2167T, Melbourne, Victoria, 3001.

Australian Conservation Foundation newsletter
Frequency: monthly
Publisher: Australian Conservation Foundation, 206 Clarendon Street, East Melbourne, Victoria, 3002.

Australian Conservation Foundation occasional publication.
Frequency: irregular
Publisher: Australian Conservation Foundation, 206 Clarendon Street, East Melbourne, Victoria, 3002.

Australian Conservation Foundation special publication.
Frequency: irregular
Publisher: Australian Conservation Foundation, 206 Clarendon Street, East Melbourne, Victoria, 3002.

Australian Conservation Foundation viewpoint series.
Frequency: irregular
Publisher: Australian Conservation Foundation, 206 Clarendon Street, East Melbourne, Victoria, 3002.

Australian fisheries
Frequency: monthly
Publisher: Australian Department of Primary Industry, Fisheries Division, Canberra, ACT, 2600.

Australian health surveyor
Frequency: monthly
Publisher: Australian Institute of Health Surveyors, Medical Library.

Australian journal of botany
Frequency: irregular
Publisher: CSIRO, 314 Albert Street: East Melbourne, Victoria, 3002.

Australian journal of marine and freshwater research
Frequency: irregular
Publisher: CSIRO, 314 Albert Street, East Melbourne, Victoria, 3002.

Australian journal of soil research
Frequency: irregular
Publisher: CSIRO, 314 Albert Street, East Melbourne, Victoria, 3002.

Australian natural history
Frequency: irregular
Publisher: Australian Museum, 6-8 College Street, Sydney, NSW, 2000.

Australian parks
Frequency: quarterly
Publisher: Australian Institute of Parks and Recreation, PO Box 18, Northcote, Victoria, 3070.

Australian urban studies
Frequency: quarterly
Publisher: Australian Institute of Urban Studies, PO Box 809, Canberra City, ACT, 2601.

Australian wildlife newsletter
Frequency: irregular
Publisher: Wild Life Preservation Society of Australia, GPO Box 3428, Sydney, NSW, 2001.

Australian wildlife research
Frequency: twice yearly
Publisher: CSIRO, 314 Albert Road, East Melbourne, Victoria, 3002.

Australia's wildlife heritage
Frequency: weekly
Publisher: Paul Hamlyn, Dee Why West, NSW.

The Australian zoologist
Frequency: twice a year?
Publisher: Royal Zoological Society of NSW, c/o Taronga Zoo, Mosman, NSW, 2088.

Australia's environmental law
Frequency: loose leaf
Publisher: PA Management Consultants Pty, Ltd., 221 Miller Street, North Sydney, NSW, 2060.

Beach conservation
Frequency: quarterly
Publisher: Beach Protection Authority, GPO Box 2195, Brisbane, Queensland, 4001.

Beach use
Frequency: irregular
Publisher: Port Phillip Authority, 480 Collins Street, Melbourne, Victoria, 3000.

The bird observer
Frequency: monthly
Publisher: Bird Observers Club, GPO Box 2167T, Melbourne, Victoria, 3001.

Clean air
Frequency: quarterly
Publisher: Clean Air Society of Australia and New Zealand, PO Box 163, Lidcombe, NSW, 2141.

Communicate
Frequency: irregular
Publisher: Newsletter of the Australian Recreation Research Association.

Community
Frequency: 11 times a year
Publisher: Australian Department of Urban and Regional Development, PO Box 1890, Canberra City, ACT, 2601.

Conservation Council of Victoria newsletter
Frequency: 3 times a year
Publisher: Conservation Council of Victoria, 15 Drummond Street, Carlton, Victoria, 3053.

Conservation in Australia/living earth
Frequency: irregular
Publisher: Conservation Society of New South Wales, Agriculture House, 195 Macquarie Street, Sydney, NSW, 2000.

Conservation Society of New South Wales newsletter
Frequency: quarterly
Publisher: Conservation Society of New South Wales, Agriculture House, 195 Macquarie Street, Sydney, NSW, 2000.

Dandenong ranges news
Frequency: quarterly
Publisher: Save the Dandenongs League c/o *Kakirra*, Kalorama, Victoria, 3766.

EIC Newsletter
Frequency: monthly
Publisher: Environment Information Centre, PO Box 72, Rundle Street, Adelaide, SA, 5000.

Earth garden, natural living and growing
Frequency: quarterly
Publisher: edited and published by Irene and Vincent Smith, PO Box 111, Balmain, NSW, 2041.

Eco Info
Frequency: bi-monthly
Publisher: Queensland Conservation Council Inc, PO Box 59, Toowong, Queensland, 4066.

Ecological Society of Australia bulletin
Frequency: quarterly
Publisher: Ecological Society of Australia, c/o Research School of Biological Sciences, Australian National University, PO Box 475, Canberra, ACT, 2601.

Ecological Society of Australia proceedings
Frequency: annual
Publisher: Ecological Society of Australia, c/o Research School of Biological Sciences, Australian National University, PO Box 475, Canberra, ACT, 2601.

Ecos
Frequency: quarterly
Publisher: CSIRO, PO Box 225, Dickson, ACT, 2602.

Emu
Frequency: quarterly
Publisher: Royal Australian Ornithologists Union, GPO Box 5236 BB, Melbourne, Victoria, 3001.

Energy
Frequency: monthly
Publisher: edited by Robert Ferris, Printwrite, Sydney, NSW.

Environment control news
Frequency: monthly
Publisher: W. R. Cooper and Associates, Sydney, NSW.

Environment news
Frequency: annual
Publisher: Glenroy High School Clean Air and Environment Council, Hilton Street, Glenroy, Victoria, 3046.

Environment Studies Association of Victoria newsletter
Frequency: irregular
Publisher: Environment Studies Association of Victoria, 15 Drummond Street, Carlton, Victoria, 3053.

Environmental control
Frequency: quarterly
Publisher: Environmental Control Council of Queensland, Co-ordinator-General's Department, PO Box 185, North Quay, Queensland, 4000.

Environmental quality bulletin
Frequency: monthly
Publisher: Australian Mining Industry Council, PO Box 240, Civic Square, ACT, 2608.

Environmental topics news summary
Frequency: weekly
Publisher: Centre for Environmental Studies, University of Melbourne, Parkville, Victoria, 3052.

ESAV news
See Environment Studies Association of Victoria newsletter
Express
Frequency: irregular
Publisher: Public Transport Group, Melbourne.

Forest and timber
Frequency: three times a year
Publisher: Forestry Commission of New South Wales, 93-95 Clarence Street, Sydney, NSW, 2000.

Forest focus
Frequency: quarterly
Publisher: Forests Department of Western Australia, 54 Barrack Street, Perth, WA, 6000.

Forest resources newsletter
Frequency: irregular
Publisher: Australian Forestry Council, c/o Forestry and Timber Bureau, Banks Street, Yarralumla, ACT, 2600.

Fur, feathers and fins
Frequency: publication suspended 1973/74
Publisher: Fisheries and Wildlife Division, Ministry for Conservation, 240 Victoria Parade, East Melbourne, Victoria, 3002.

GHD newsletter
Frequency: not known
Publisher: Gutteridge Haskins & Davey Pty. Ltd., Consulting Engineers, 380 Lonsdale Street, Melbourne, Victoria, 3000.

Good earth
Frequency: quarterly
Publisher: Organic Farming and Gardening Society (Australia), GPO Box 2605W, Melbourne, Victoria, 3001.

Grass roots
Frequency: quarterly
Publisher: Grass Roots, Box 900, Shepparton, Victoria 3630.

Habitat Australia
Frequency: monthly
Publisher: Australian Conservation Foundation, 206 Clarendon Street, East Melbourne, Victoria, 3002.

Hunter natural history
Frequency: quarterly
Publisher: Newcastle Flora and Fauna Protection Society, 114 Victoria Street, New Lambton, NSW, 2305.

Industrial research news
Frequency: quarterly
Publisher: CSIRO, PO Box 225, Dickson, ACT, 2602.

Journal of the Soil Conservation Service of NSW
Frequency: irregular
Publisher: Soil Conservation Service of New South Wales, 18-24 Pitt Street, Sydney, NSW, 2000.

Kangaroo Protection Committee newsletter
Frequency: quarterly
Publisher: Kangaroo Protection Committee, GPO Box 3719, Sydney, NSW, 2001.

Koolewong
Frequency: quarterly
Publisher: Royal Zoological Society of New South Wales, Taronga Zoo, Mosman, NSW, 2088.

Lab talk
Frequency: bi-monthly
Publisher: Science Teachers Association of Victoria, Melbourne.

Landscape Australia
Frequency: irregular
Publisher: The Australian Institute of Landscape Architects Inc., Queensland Committee, ed. F. Thompson, 523 Tingal Road, Wynnum North, Queensland, 4178.

Latrobe Valley naturalist
Frequency: irregular
Publisher: Latrobe Valley Field Naturalists, 14 Barry Street, Morwell, Victoria, 3840.

Learning exchange
Frequency: monthly
Publisher: Learning Exchange, 1078 High Street, Armadale, Victoria, 3143.

Living city
Frequency: twice yearly
Publisher: Melbourne & Metropolitan Board of Works, 625 Little Collins Street, Melbourne, Victoria, 3000.

The living earth
See *Conservation in Australia/living earth*

MEG newsletter
Frequency: monthly
Publisher: Montrose Environmental Group, PO Box 2, Montrose, Victoria, 3765.

MMBW newsletter
Frequency: monthly
Publisher: Melbourne and Metropolitan Board of Works, 625 Little Collins Street, Melbourne, Victoria, 3000.

Minerals research in CSIRO
Frequency: quarterly
Publisher: CSIRO Minerals Research Laboratories, PO Box 136,

Moonbi
Frequency: monthly
Publisher: Fraser Island Defence Organisation, PO Box 420, Maryborough, Queensland, 4650.

Mount Lofty Ranges Association viewsletter
Frequency: monthly
Publisher: Mount Lofty Ranges Association, PO Box 70, Aldgate, SA, 5154.

Myall Lakes bulletin
Frequency: irregular
Publisher: Myall Lakes Committee, Box 102, The Union, Sydney University, Sydney, NSW, 2006.

NAPWI
Frequency:
Publisher: National Parks and Wildlife Service, 189 Kent Street, Sydney, NSW, 2000.

NPA bulletin
Frequency: quarterly
Publisher: National Parks Association of the Australian Capital Territory Inc., PO Box 457, Canberra City, ACT, 2601.

NPA news
Frequency: irregular
Publisher: National Parks Association of Queensland, GPO Box 1752, Brisbane, Queensland, 4001.

National parks journal
Frequency: monthly
Publisher: National Parks Association of New South Wales, PO Box 94, Sutherland, NSW, 2232.

Native Fauna Conservation Society newsletter
Frequency: quarterly
Publisher: Ed. Mrs. J. May, 11 Hone Avenue, Blackburn South, Victoria, 3130.

Native Plants Preservation Society of Victoria newsletter
Frequency: irregular
Publisher: Ed. Mrs. A. Faithfull, 67 Athelstan Road, Camberwell, Victoria, 3124.

Nature notes
Frequency: monthly
Publisher: Ringwood Inspectorate, Nunawading, Victoria, 3131.

Off roader
Frequency: irregular
Publisher: Gibb & Associates Pty. Ltd., 464 St. Kilda Road, Melbourne, Victoria, 3004.

Operculum
Frequency: bi-monthly
Publisher: Australian Littoral Society, PO Box 82, St. Lucia, Queensland, 4067.

PIEC Packaging Industry Environment Council newsletter
Frequency: monthly
Publisher: Packaging Industry Environment Council, 370 St. Kilda Road, Melbourne, Victoria, 3004.

Parks and wildlife
North Ryde, NSW, 2113.

Peninsula Conservation League newsletter
Frequency: irregular
Publisher: Peninsula Conservation League, Box 194, Mornington, Victoria, 3931.

Petroleum gazette
Frequency: quarterly
Publisher: Petroleum Information Bureau, 227 Collins Street, Melbourne, Victoria, 3000.

Plan news review
See *Space*
Planning news
Frequency: twice a year
Publisher: State Planning Authority, GPO Box 1815, Adelaide, SA, 5001.
Planning SA: incorporating South Australian Conservation bulletin
Frequency: six times a year
Publisher: Town and Country Planning Association (SA) Inc., 13 Leigh Street, Adelaide, SA, 5000.

Port of Melbourne quarterly
Frequency: quarterly
Publisher: Melbourne Harbour Trust Commissioners, 29 Market Street, Melbourne, Victoria, 3000.

The powder magazine
Frequency: irregular
Publisher: Light, Powder and Construction Works, Melbourne, Victoria.

QNC news
Frequency: mon'nly
Publisher: Queensland Naturalists Club, Ed. Dr. A. B. Cribb, 41 Yarawa Street, Kenmore, Queensland, 4096.

Queensland naturalist
Frequency: irregular
Publisher: Queensland Naturalists Club, 70 Mt. Nebo Road, The Gap, Queensland, 4061.

Queensland journal of agriculture and animal sciences
Frequency: quarterly
Publisher: Queensland Department of Primary Industries, William Street, Brisbane, Queensland, 4000.

RAOU newsletter
Frequency: quarterly
Publisher: Royal Australasian Ornithologists Union, GPO Box 5236 BB, Melbourne, Victoria, 3001.

RAPIJ
Frequency: quarterly
Publisher: Royal Australian Planning Institute, PO Box 796, Canberra City, ACT, 2601.

Re-create
Frequency: quarterly
Frequency: monthly
Publisher: Tasmanian Conservation Trust, GPO Box 684 G, Hobart, Tasmania, 7001.

Riverlander
Frequency: six times a year
Publisher: Murray Valley Development League, PO Box 359, Albury, NSW, 2640.

Royal Australian Planning Institute journal
See *RAPIJ*

Royal Society of Victoria proceedings
Frequency twice a year
Publisher: Royal Society of Victoria, 9 Victoria Street, Melbourne, Victoria, 3000.

Rural research
Frequency: quarterly
Publisher: CSIRO, PO Box 225, Dickson, ACT, 2602.

Save Colong bulletin
Frequency: irregular
Publisher: The Colong Committee, 18 Argyle Street, Sydney, NSW, 2000.

Search
Frequency: monthly
Publisher: Australian and New Zealand Association for the Advancement of Science (ANZAAS), 157 Gloucester Street, Sydney, NSW, 2000.

Shelter
Frequency: quarterly
Publisher: Australian Department of Housing and Construction, Yarra Street, Hawthorn, Victoria, 3122.

Slow burn
Frequency: not known
Publisher: Friends of the Earth (Victoria), 59 Macarthur Place
Publisher: Edited by R. Bowden and others, Canberra, ACT.

Smoke signal
Frequency: monthly
Publisher: South Coast Conservation Society, PO Box 57, Kiama, NSW, 2533.

Soil Conservation Authority news
Frequency: irregular
Publisher: Soil Conservation Authority, 378 Cotham Road, Kew, Victoria, 3101.

Soil Conservation Service of NSW journal
Frequency: quarterly
Publisher: Soil Conservation Service, 18-24 Pitt Street, Sydney, NSW, 2000.

South Australian conservation bulletin
See *Planning SA*
South Australian naturalist
Frequency: quarterly
Publisher: Field Naturalists Society of SA Inc., GPO Box 1594, Adelaide, SA, 5001.

Space: incorporating Plan news review
Frequency: irregular
Publisher: Town and Country Planning Association of Victoria, 90 St Helen's Road, East Hawthorn, Victoria, 3123.

Survival
Frequency: 3 times per year
Publisher: Gould League of Victoria, Alamein Primary School, PO Box 96, Ashburton, Victoria, 3147.

Tasmanian naturalist
Frequency: monthly
Publisher: Tasmanian Field Naturalist Club, GPO Box 68 A, Hobart, Tasmania, 7001.

Tourism Australia
Frequency: 3 times per year
Publisher: Australian Tourist Commission, 414 St Kilda Road, Melbourne, Victoria, 3004.

Townsville naturalist
Frequency: irregular
Publisher: Townsville and District Natural History and Conservation Society, PO Box 178, Townsville, Queensland, 4810.

Trust newsletter
Frequency: monthly
Publisher: National Trust of Australia (Victoria), *Como*, South Yarra, Victoria, 3141.

Urban issues
Frequency: quarterly
Publisher: Australian Institute of Urban Studies, Queensland Division, Box 1989, Brisbane, Queensland, 4001.
South, Carlton, Victoria, 3053.

VFGA news, Port Phillip region
Frequency: not known
Publisher: Victorian Field and Game Association, 1 Fairview Street, Belmont, Victoria, 3216 .

Valley Freeway Action Group newsletter
Frequency: bi-monthly
Publisher: Valley Freeway Action Group, 607 The Boulevard, Heidelberg, Victoria, 3084.

Viewsletter
See *Mount Lofty Ranges Association viewsletter*

Victorian historical magazine
Frequency: quarterly
Publisher: Royal Historical Society of Victoria, 19 Queens Street, Melbourne, Victoria, 3000.

Victorian National Parks Association newsletter
Frequency: quarterly
Publisher: Victorian National Parks Association, 15 Drummond Street, Carlton, Victoria, 3053.

Victorian naturalist
Frequency: monthly
Publisher: Field Naturalists Club of Victoria, ed. Mr G. M. Ward, 54 St James Road, Heidelberg, Victoria, 3084.

Victoria's resources
Frequency: 6 times a year
Publisher: Natural Resources Conservation League of Victoria, PO Box 104, Springvale, Victoria, 3171.

Wambaliman
Frequency: monthly
Publisher: Wildlife Preservation Society of Queensland, Bundaberg Branch and Maryborough-Moonaboola Branch, ed. Mr. J. Sinclair, 50 Queens Street, Maryborough, Queensland, 4650.

Water talk
Frequency: quarterly
Publisher: Victorian State Rivers and Water Supply Commission, 590 Orrong Road, Armadale, Victoria, 3143.

Water Research Foundation of Australia bulletin
Frequency: irregular
Publisher: Water Research Foundation of Australia, PO Box 47, Kingsford, NSW, 2032.

Water Research Foundation of Australia newsletter
Frequency: monthly
Publisher: Water Research Foundation of Australia, PO Box 47, Kingsford, NSW, 2032.

Water Research Foundation of Australia reports
Frequency: irregular
Publisher: Water Research Foundation of Australia, PO Box 47, Kingsford, NSW, 2032.

Water resources newsletter
Frequency: 2 issues per year
Publisher: Australian Water Resources Council, PO Box 1937, Canberra City, ACT, 2601.

Westernport Bay Environmental Study technical newsletter
Frequency: irregular
Publisher: Westernport Bay Environmental Study, 240 Victoria Parade, East Melbourne, Victoria, 3002.

Wildlife in Australia
Frequency: quarterly
Publisher: Wildlife Preservation Society of Queensland, GPO Box 2030, Brisbane, Queensland, 4001.

Wildlife newsletter
Frequency: monthly
Publisher: Wildlife Preservation Society of Queensland, Gold Coast and Hinterland Branch, PO Box 324, Surfers Paradise, Queensland, 4217.

Yarra Brae newsletter
Frequency: irregular
Publisher: Yarra Brae Action Committee, 42 The Avenue, Parkville, Victoria, 3052.

Yarra Valley Conservation League newsletter
Frequency: irregular
Publisher: Yarra Valley Conservation League, 1 Hodgson Street, Heidelberg, Victoria, 3084.

ZPGS news
Frequency: irregular
Publisher: Zero Population Growth Society, Melbourne Branch, PO Box 95, Parkville, Victoria, 3052.

ZPG news
Frequency: bi-monthly
Publisher: Zero Population Growth Australia, Sydney Branch, PO Box 248, Neutral Bay Junction, NSW, 2089.

Environmental information: some problems and solutions.

Edited by Mari Davis. Melbourne, Centre for Environmental Studies, 1974.

Errata

p 28. para 2 line 10 should read Technisearch Limited

p 51. *CSIRO abstracts.* Should read:

CSIRO index (formerly *abstracts).* CSIRO, Melbourne. Enriched titles (fmly abstracts) of CSIRO papers; includes author and subject indexes.

CSIRO SDI system search output. CSIRO, Melbourne.

Fortnightly or weekly. Includes material from data bases searched by CSIRO: BA Previews; CA Condensates; Food Science and Technology Abstracts; INSPEC (Physics Abstracts; Electrical and Electronics Abstracts; Computers and Control Abstracts); Selected Water Resources Abstracts.

p 62. lines 9 & 10 should read *(Phytophthera cinnamomi)*

p 70. *Australian health surveyor.* Delete Medical Library

p 77. *Parks and wildlife.* Should read:

Frequency: irregular
Publisher: National Parks and Wildlife Service, 189 Kent Street, Sydney, NSW, 2000.